The Builder.

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ILLUSTRATIONS.

Tower and Spire, St. Michael's, Coventry: Elevation and Plans.—From a Drawing by the late Mr. J. Drayton Wyatt ..... *Four-Page Ink-Photo.*
Seaton Delaval Hall, Northumberland.—Sir John Vanbrugh, Architect ..... *Two Single-Page Photo-Litho's.*
New R. C. Church and Rectory, Carlisle.—Messrs. Dunn, Hansom, & Dunn, Architects ..... *Single-Page Photo-Litho.*
Premises, No. 18, Bishopsgate-street-Within.—Messrs. W. E. & F. Brown, Architects ..... *Single-Page Photo-Litho.*

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Wakefield County Council Offices Competition.

THE result of this competition was briefly referred to in last week's issue, and we are now able to give more detailed reference to the designs which were submitted. The competition originated in the proposal to provide Council Chamber and offices at Wakefield for the County Council of the West Riding of Yorkshire, and the West Riding General Purposes Committee were empowered by the County Council to take the necessary preliminary steps. The instructions to competitors and the conditions that were issued appear to have been carefully prepared, and in giving a schedule of the accommodation required arbitrary restrictions likely to hamper the individuality of the architect were avoided. Section 1 dealt with the Council Chamber, to seat 150 members, four Committee rooms, Chairman's room, luncheon and smoking rooms, kitchen and caretaker's apartments, whilst Section 2 scheduled nine rooms for the Accountant; Section 3 seventeen rooms for the Clerk of the Peace and County Council, his deputy, and the Clerk of Indictments, three rooms for Asylums, five for Technical Instruction Department, and three rooms for that of the Weights and Measures. Section 4 enumerated seven rooms for the Medical Officer of Health; Section 5 twelve rooms for the West Riding Solicitor, and Section 6 eleven rooms for the West Riding Surveyor. The site for the new buildings is bounded by Bond-street, Cliffe Parade, Burton and Hardy streets. The present Council offices are accommodated in a building now occupying the site, and competitors were invited to submit, if they thought fit, an alternative scheme utilising these buildings, but this suggestion was not acted upon by any of the competitors, entirely new buildings being provided. The Council reserved to itself the right of making its own selection of designs, aided by the assistance of the West Riding Surveyor and Architect, and the award that has been made shows that no injustice has been done to competitors.

The premiums that were offered were 200*l.* to the successful competitor, in addition to the usual commission for carrying out the work, 100*l.* to the design placed second, and 50*l.* to that placed third; and twenty-eight sets of designs were submitted. Of these, three designs were selected in the following order, that by Messrs. Gibson & Russell, of Westminster; Messrs. Cooksey & Cox, of Charing Cross; and Messrs. Simpson & Richardson, of Wakefield. The drawings were publicly exhibited in the Wakefield Corn Exchange on the afternoon of Wednesday of last week, and on Thursday a private view was granted to exhibitors and the press in the Wakefield Grand Jury Room. Recognition is due to the County Council officials for their courtesy in supplying information and offering facilities to those interested in the exhibition. As the names of the authors of the premiated designs only were made known, we are obliged to refer to some of the designs only by the mottoes they bore.

Messrs. Gibson & Russell deserve credit for the able way in which they have grasped the problem offered by the lines and shape of the site, and the simplicity with which they have planned a building in every way suitable to the ground it has to occupy. It needed only a slight deviation from the lines of two of the less important streets surrounding the site to form a true diamond shape, and this has been adopted by the authors, who take Bond-street as the principal frontage and base of the parallelogram, and the position of the principal entrance at the corner of Bond-street and Cliffe Parade. By disposing the buildings around the site in this way, with a perfectly lighted corridor on the interior face of the building, a simple plan is produced, with large central areas each side of the Council Chamber, which is placed on the shorter axis of the parallelogram immediately opposite the principal entrance, and in an interior position which provides the quietness of surroundings necessary for a chamber of debate. The position allotted to the secondary staircases and lavatories on each floor in the interior angles on the long axis is a good one, easily accessible from either corridor. Provision had to be made in the designs for future additions, and these Messrs. Gibson & Russell showed at the angle of Burton and Hardy streets, opposite the main entrance, and until these are made the buildings will not continue along the whole of the two less important sides of the parallelogram. The secondary entrances are at the junction of Bond and Hardy streets and Cliffe Parade and Burton-street, so that ultimately there will be entrances at each corner. The secondary staircases are immediately adjacent to the secondary entrances, and the public and officials will have convenient access to all the business departments without necessarily using the principal entrance. The principal entrance leads into a staircase hall, with a waiting-room beyond for deputations, thence the general staircase leads to the first-floor and Council Chamber, where convenient cloak-room accommodation is provided. A large anteroom leads on to the chamber itself, which has its seats arranged amphitheatrically so as to face the Chairman and the officials' table in centre. The Chairman's parlour is placed over the entrance vestibule, and has on the left on the corridor the four Committee rooms facing Cliffe Parade, and on the left hand a corridor with rooms for the clerks' department facing Bond-street. The Councillors' smoking and luncheon rooms are placed beyond the Committee room at the corner of Cliffe Parade and Burton-street, with the kitchen and caretaker's rooms over. The Accountant's department is placed on the ground floor facing Cliffe Parade, with the Surveyor's department facing Bond-street The offices of the Clerk of the Peace and County Council are on the first and second floor. The Asylums department has been placed on the second-floor between the clerks' and Solicitor's departments. The ground floor of the central Council Chamber block is allotted to the technical instruction offices. The remaining departments are placed as follows:—Weights and Measures on the ground floor facing Burton-street; the Medical Officer of Health on the first floor above the last named; whilst the West Riding Solicitor department is placed on the second floor facing Cliffe Parade and part of Bond-street.

Messrs. Gibson & Russell have not thought it necessary to provide passenger lifts, but lifts for coals have been provided in the angle blocks for lavatories already referred to. The basement is devoted to stores and workshops, and for the introduction of stores, a cart entrance is provided in the centre of the Hardy-street frontage. The

authors state that their elevations are Renaissance with English detail, such as may be met with at Kirby and Wollaton Halls. The main elevations are to Cliffe Parade and Bond-street, and a domed campanile is placed over the main entrance at the angle. The Bond-street elevation has two gables at the Hardy-street and one gable at the other end. The intervening space is differently treated, with large circular windows on the ground floor, mullioned and transomed windows on the first and circular headed windows on the second floor, below which a bold band of strap-work decoration is introduced. The elevations are distinctly graceful, and considerable variety of line and detail is introduced. The portion of the Cliffe Parade façade containing the Committee-rooms is treated in a somewhat similar manner, with the introduction of richer detail and carving. The authors state that they propose to use local bricks, with dressings of Elland Edge stone, and red tile roofs. We notice, however, that the elevations show little indication of such treatment, being evidently designed for stone façades. The limit of cost was not referred to in the conditions, and has therefore led to considerable divergence in the estimates of competitors. Messrs. Gibson & Russell's estimate amounts to 60,000*l*.

Messrs. Cooksey & Cox have adopted an entirely different principle in planning their building. Discarding the shape of the site as guiding lines, they have endeavoured to arrange a right-angled building upon a diamond-shaped site, and though they have been more successful than could have been expected, the result is a loss of simplicity in arrangement and a sacrifice of valuable space. Bond-street is taken as the principal frontage, which is set back so as to be at right-angles to the blocks of buildings facing Cliffe Parade and Hardy-street, and the latter is brought beyond the main front to the full extent of the site. The Council Chamber is well placed in the centre of the site, and the back portion, facing Burton-street, has been reserved for future extensions. The front entrance occupies the centre facing Bond-street, and from the entrance-hall corridors proceed right and left, and lead into the corridors which run the length of the side blocks. At the end of these single corridors secondary entrances for the public and officials are placed, and the staircase to upper floors, with lavatories adjacent, occupy a projecting block between the corridors and the central block. The principal departments are arranged on the two side blocks, the Surveyor's department being placed in the Hardy-street frontage for the sake of the north light. The four Committee-rooms face Bond-street, and are on the first floor, with luncheon and smoking room on the second floor above. The Chairman's room is placed near the head of the main staircase. The special points of the plan of the Council Chamber is the ante-room, with a division lobby on each side. The chamber itself has been planned with a segmental-shaped back wall, and a segmental apse for the Chairman and officials. The plan has evidently been carefully thought out, and has many good points, but we think that a diamond plan is the best arrangement, with the entrance at the angles. The staircases to the principal department in this design are not readily seen on entering the building by the secondary entrances. Messrs. Cooksey & Cox estimate the cost of the building at 55,000*l*. The elevations, which are delicately drawn, are kept quiet in character, and are intended to be executed in brick, with stone dressings and a red tiled roof. A tower has been dispensed with. The central porch is semicircular on plan, and the central feature is a fleche, which is not quite happy in the lines with which it joins the roof. The considerable projection of the Hardy-street block is not apparent, and the effect in perspective would not be altogether happy, we think. The detail is distinctly original and delicate in parts, but at times it is weak, as in the central portion of the main front, where thin pilasters appear to support a cornice of somewhat massive proportions. The elevations to Cliffe Parade and Hardy-street are much alike in composition, and are distinguished by four semi-circular pediments, two at each end. This central portion of the long line of roof is kept up, and the centre is emphasised by a copper fleche.

Messrs. Simpson & Richardson, of Wakefield, in their design followed the diamond shape of the plot and placed the main entrance at the corner of Bond-street, and the Council Chamber occupies the position it should in the centre of the site. The darkness of the corridor, however, upon each side of which offices are ranged, is not a good point. The staircases are dotted about in various and not always similar positions, and would not easily be found by the public. The elevations are carefully drawn, and show a considerable amount of quiet dignity.

Only brief reference can be made to some of the remaining designs, and of these the mottoes only were published. "Lux" has a circular Council Chamber in the interior position, and has grouped the Committee-rooms around it. The position is a good one for the Committee-rooms, which are there top-lighted, but it unduly cramps other portions of the plan. The main entrance is in the centre of Bond-street.

"Honi Soit Qui Mal y Pense" places the main entrance in the centre of Bond-street frontage, The corridors are mostly double. The Council Chamber is placed on the Hardy-street frontage. The square plan on the diamond shape is here very evident.

"Toison d'Or" is distinguished by a remarkable similarity of plan to that adopted by Messrs. Gibson & Russell. Position of main entrance, single corridors, position of Council Chamber, and staircases, and lavatories all coincide in a singular manner, and had the elevations, which show a certain refinement of detail in parts, been a little less heavy as a whole, the design might have occupied a better place in the competition.

"Tutus in undis" has a central entrance in Bond-street, with a square and octagonal chamber in the interior position. The plan is simple in its lines, and the elevations are quiet and well-proportioned. A feature is made of the tower.

"Experience" adopts the square-lined plan, and has shown considerable ingenuity in grouping the Committee-rooms round the Council Chamber in the interior with well-lighted corridors. The elevations are a somewhat severe treatment of an early type of the Renaissance.

We are glad to be able to endorse the award made in this competition.

THE MEISSONIER EXHIBITION.

THE exhibition of the works of Meissonier at Messrs. Tooth's Gallery is not quite such a representative one as we are asked to suppose; it does not contain all the works exhibited in Paris, and we can recall in our memory many examples of the small and exquisitely-finished class of miniature works which more especially made Meissonier's reputation, which are not to be seen here. In fact, the larger proportion of the works here exhibited, numerically, are sketches and studies, and not finished pictures. But there are sufficient very fine specimens of the artist's finished work to give an adequate idea of his powers, while the large number of sketches and studies, hitherto unknown to the public, have a new and special interest, as taking us behind the scenes and letting us into the manner of working of a painter who, as craftsman at all events, may claim a place among the greatest masters of the brush that the world has ever known.

A translation of the biographical sketch of the artist's life and character by Dumas is prefixed to the catalogue. As our Paris correspondent has already noted, this is a very *couleur de rose* portrait of the artist by a very friendly hand. The fact we believe is undeniable that Meissonier was anything but a popular character, and made and left very few friends. Yet there are points in this biographical sketch which may perhaps suggest reasons for this which are not entirely unfavourable to him. To anyone who had asked how he had contrived to produce such an amount of highly-finished and indeed faultless work, he might have replied, says Dumas, that it was because he was always thinking about it, and it was probably in some measure owing to this intense pre-occupation with his art that he appeared cold and unsympathetic in his social relations. Of his unwearied application in rendering his work perfect Dumas mentions a remarkable instance in the case of his own portrait, which had been sent to the Salon after about forty sittings. But Meissonier said, "After the picture returns you must give me twenty sittings more, for the portrait is still far from what it ought to be"; and this was for a picture which he was executing as a gift and not for gain. Surely this is a noble and instructive example of the striving after perfection which is the characteristic of the true and devoted artist.

Such a collection as this suggests, indeed, a fresh consideration of the often-repeated question as to what are the qualities which constitute real greatness in the work of a painter. In the whole of this collection there can hardly be said to be one work which exhibits imaginative power or that striving after an ideal beauty which we often speak of as the highest end of art. And yet we can hardly recall any exhibition of the collected works of one painter from which it seemed so difficult to tear oneself away, or in which the principal works seem so absolutely certain to retain their position as art treasures of permanent and imperishable value, a value which depends entirely upon the perfection of the artist's mastery of his art within his own limits. To take one of the most typical works in the room, "Le Peintre d'Enseignes" (849), well known from engravings—one could hardly imagine a subject of less intrinsic interest. It is merely a very common-looking tavern-keeper of the Napoleonic era, looking critically at the painting of a Bacchus astride of a cask which an ordinary journeyman sign-painter has been executing for him. But the picture is life itself. The "Patron" is a type of a class; and the admirable drawing and pose of the figure, the expression of his face, screwing up his eyes as he gazes at the work, the careful and conscientious painting of the costume, the manner in which the painting itself, seen in much foreshortened perspective, is yet finished as carefully as if this were the main object of the work; all show us an artist who was content with nothing short of perfection in the task he had set himself. Yet even this is surpassed by some others, for instance "Les Joueurs d'Echecs" (851), a small painting of two men over a chessboard, which is quite astonishing in its minuteness and mastery of execution; each of the small chessmen, even, about an eighth of an inch high, seems a separate study. Say what we will about the prosaic character of the subject, it is impossible to imagine that such a work can ever lose its value (as long as pigments last) as an example of brilliant and conscientious craftsmanship. Another which should be especially looked at is the one entitled "Gentilhomme Louis XIII." (147) a single figure with an architectural background, remarkable as much for the learned and solid painting of the face, turned a little upward in full light, as for the minute and perfect execution of every detail of the costume. "Le Voyageur" (1,074), a horseman riding slowly against a strong wind, is another most remarkable work, more especially in the manner in which the laboured action of the animal is conveyed. A smaller picture which may be taken as a study for this, but with the horse turned the opposite way, is in another room. In the "Iéna, 1806"

(1,073), we have one of the most striking of Meissonier's portraits of Napoléon, looking with fixed and concentrated gaze after the cavalry who are charging. In painting Napoléon Meissonier comes nearer to the quality of imaginative insight than in most of his other works; he gives the character as well as the outer semblance of the man. The two finest examples of this penetration in painting Napoléon, the "1814" and the "Retreat from Moscow," are not in this exhibition. The "1814" may be said to be one of the most remarkable instances of the expression of a whole history concentrated in one figure and in one moment that has ever been seen in painting; but it must be admitted that this power of intense character-expression is somewhat exceptional in Meissonier's work; Napoléon seems to have had a special fascination for him. Several studies here indicate the trouble he was at in studying the outer personality of his hero; one of a horseman with the head omitted, facing the spectator, is evidently intended as a study of Napoleon's figure and seat on horseback.

The numerous studies of horses, men, and parts and limbs of men and horses, speak eloquently of the pains Meissonier took in preparing and perfecting his work. When his great water-colour painting, "1807," was first exhibited in London, we noticed particularly the remarkable drawing of the figure of the officer leading the charge, and half turning in his saddle to salute Napoleon, the left leg stretched out in the stirrups to maintain his balance. There are two or three studies for this leg, of which the perfect and successful attempt seems to be "Jambe gauche du colonel en selle," No. 278. Other figures or parts of figures for the group of galloping horsemen in the same picture are to be met with at intervals all round the room.

The later works in water-colour, on a larger scale than Meissonier's earlier manner, are perhaps among the finest things in the exhibition, and their breadth and freedom of style seems the more emphasised by contrast with the minuter work of most of the oil paintings. "Le Guide" (423), showing a man walking in front of a group of cavalry riding down a road towards the spectator, is one of the finest of these; and another very remarkable work, a broad and grand sketch in water-colour under the title "Sur l'escalier" (429) is worth special attention; it shows a man and woman looking over the balustrade of a staircase at something or some one below, and has something more of poetic feeling and suggestion about it than is usual with Meissonier; there is at all events a certain interest in it beyond the power of execution; it suggests a critical point in a story. A highly interesting little picture, which is hung too high to be well seen, is "Ruines des Tuileries" (416), a very carefully painted study of part of the interior of the Tuileries after the fire. At the end of the ruined building is just seen in the distance the top of the Arc de l'Etoile.

It will surprise many who only know Meissonier by the class of subjects usually connected with his name, to find so many small studies of landscape and buildings, portions of towns, &c., and even two or three seapieces, among the works exhibited; and though he was not so great in these as in his favourite class of figure-subjects, they all show competent and careful handling, the buildings not the least so. The exhibition is one of the artistic events of the season, and should be missed by none who care for art: no such opportunity is likely to occur again.

A NEW J.P. WELL KNOWN TO BUILDERS.—Mr. Alexander Ritchie, Kelvin-house, South Lambeth-road, and of the firm of Steven Bros. & Co., iron-founders, Upper Thames-street, has been appointed by the Lord Chancellor, on the recommendation of the Lord-Lieutenant, the Duke of Westminster, a Justice of the Peace for the County of London. Mr. Ritchie is also a member of the Court of Common Council, and is a "London Scotsman" well known in connexion with Scottish institutions in London.

NOTES.

THE Hull dock strike, as we anticipated last week, was hardly set on foot before all sorts of side issues were brought in, with the object of causing the origin of the dispute to drop out of sight. The employers were represented as making a "dastardly" effort to smash the Dockers' Union, although the Secretary of the Shipping Federation, when charged with this, replied decidedly, "Oh, no! We do not desire to smash anything, and certainly not the trades unions." The Employers' Committee at Hull also distinctly stated very early in the fight that they do not ask any applicant for work whether he is a Unionist or not, and remarked in their manifesto that their sole aim and object was to enforce the elementary right on their part to employ both free and organised labour without let or hindrance. The labour leaders made much of the action of the magistrates and guardians, and of the presence of the military in Hull, but in this they were obviously only following out the policy of directing attention to anything rather than the original point in dispute. This was passed by with the statement that the insistance on the right to combine was all that the men claimed; —a right, the assertion of which by employers is usually stigmatised as "dastardly." As to the military and the additional police, both the local authorities and the Home Secretary held the grand old maxim that "prevention is better than cure," and the Hull ratepayers will doubtless consider that the expenditure on this head has not been incurred in vain. The widening of the area of the dispute would have been disastrous from every point of view, and any movement tending to obviate future disturbances of this nature will be universally welcomed. The Bill introduced by Mr. Mundella on Monday has this end in view, through the means of local conciliation boards. Arbitration in labour disputes will thus be encouraged, and it is also proposed to register and report the decisions of arbitrators—a provision which cannot fail to add to the utility of the proposed boards.

SIR JAMES WHITEHEAD'S Bill to declare illegal all railway rates which exceed those paid in 1892 is rather late in the day. Notice of its introduction was not given until the companies had reinstated a very large proportion of the old rates, and promised that such advances as were retained should not exceed 5 per cent. The Bill would have been more to the purpose two or three months back, when rates were put in force which exceeded those of 1892 by 50 and 100 per cent.—and that without any intimation of future modification. As it is, the action now taken by the companies limits their net gain, under the revision, to 2½ or 3 per cent. In any case the proposed legislation is a striking commentary upon that of the past few years. The Acts fixing the maximum rates were only passed after a series of the most exhaustive Parliamentary inquiries ever held, and it is now proposed to practically repeal them. Further inquiry seems inevitable, and Mr. Mundella has promised a Select Committee to consider the effect of the revision, and the best means of settling disputes in the future. In view of the probability of this inquiry resulting in further legislation, Sir James Whitehead's measure, which was read for the first time on Monday, is only of a temporary character.

WE reported some time back that the German Emperor had decided that Professor Begas should be the sculptor of the national monument to the late Emperor William I., and we understand that the sculptor is already hard at work carrying out his commission. We now hear that the architect of the monument has also been selected by the Emperor, who has apparently given his Court architect, Herr Ihne, the cold shoulder in favour of a Herr Halmhuder, a *protégé* of the sculptor in question. Whilst Herr Ihne signed the architectural sheets to Professor Begas's competition work, it was Herr Halmhuder who worked for him on the design finally accepted by the Emperor. It is amusing to hear how Baurath Ihne drew the Emperor's attention to certain weak points of Herr Halmhuder's design, and how the Emperor, in his characteristic way, ordered his Court architect to make a better one if he could. Herr Ihne tried to, but the Emperor considered the work shown him too clumsy for the purpose, and far inferior to Herr Halmhuder's scheme. Herr Gustav Halmhuder, who drew up his designs in accordance with the wishes of Herr Begas, is quite a young man, a junior member of the New Imperial Houses of Parliament *atelier*. His name is well known in German architectural circles, and the Emperor's decision is very popular.

THE pedestal discovered in 1891 at Athens, bearing the signature of the sculptor Bryaxis, has been more than once discussed from the point of view of epigraphy. In the last number of the *Bulletin de Correspondance Hellénique* (viii., Dec., 1892), just published, M. Louis Couve offers us for the first time phototype plates of the sculptures represented on this basis, and discusses their relation to the history of Greek art in general, and the sculptures of the Mausoleum in particular. On three sides of the pedestal the same scene appears, worked in very low relief—a man on horseback advances towards a tripod. On the fourth side is the dedicatory inscription. Three persons, a father and two sons, Demainetos, Demeas, and Demosthenes, have dedicated the monument that surmounted the pedestal, a monument now lost, to commemorate victories gained by all three in succession in the contest known as anthippasia. They contended in their capacity as phylarchs. Below the inscription is the signature of Bryaxis, who was a pupil of Scopas, and a conjoint worker at the Mausoleum. M. Louis Couve, after a detailed examination, concludes that the pedestal supported not a statue, but a tripod. As Bryaxis would not be likely to make a tripod, the inscription must refer to the sculptures of the pedestal. We have, therefore, in them a specimen, and the only one extant, of the work of Bryaxis. Further, they were executed in the early part of his life—as in his middle and later life he moved to Asia-Minor, from which there is no evidence of his return.

THE "Pitt Press," Cambridge, is about to be enlarged under the superintendence of Mr. H. Dawson, architect.* The University Press originated in a grant made by Henry VIII. in 1534 to the University of a right to appoint three printers or "stationers." During the sixteenth and seventeeth centuries, the University printers did the work at their own homes. John Siberch, the first to be appointed, lived in the "Royal Arms," since a part of Gonville and Caius College, opposite St. Michael's church. Another, Thomas Buck, occupied what had been the refectory of St. Augustine's Priory, between Luthburne, since Free School, lane, and Slaughter-lane, since Corn Exchange-street. The Friars' refectory is drawn in Hammond's map (1592): its site is now occupied by the Museums and Natural Science Lecture-rooms. In 1655 the authorities leased from Queens' College a plot at the corner of Silver-street and Queens'-lane. Some premises built there by John Field were enlarged forty years later. It is stated that a printing-house was included in Gibbs's plans (1715) for the Library, Senate House, Schools, &c., opposite Market-hill. In 1762 the Syndics began to acquire the present site in Trumpington-street, between Silver-street and Mill-lane, with

* See our Tenders list of March 25; the accepted contract is for 6,183*l.* 13*s.*, by Mr. W. Tindall, of Cambridge.

purchasing the "White Lion" on the south side of Silver-street. In 1821 they bought the "Cardinal's Hat" inn, Trumpington-street, and James Walter, architect, built new premises on its site, which were completed in 1827. Meanwhile, the Senate and the Committee of subscribers to the William Pitt Fund, London, agreed to devote the surplus, after payment of 7,000*l.* for Chantrey's statue in Hanover-square (erected in 1831), to an enlargement of the Press, to be called by his name. The University voted in the end a total sum of 11,925*l.* for properties adjacent to the "Cardinal's Hat" site, and in March, 1832, the new Pitt Press was finished at a cost of 10,710*l.* after the designs, in the Late Perpendicular style, of Mr. E. Blore, architect. Various additions have since been made, including a building in the south-west corner of the quadrangle, 1877-8, planned and designed by Mr. W. M. Fawcett, architect.*

IT has been announced that the Duke of Westminster has sold to Mr. William W. Astor his Cliveden, or Cliefden estate, which forms so well known a feature on the river's left bank between Taplow and Cookham. "Cliefden's proud alcove" (as it is termed in Pope's often-quoted lines) was originally built of red brick with stone quoins and dressings, for George Villiers, second Duke of Buckingham. It passed to Lord George Hamilton, created Earl of Orkney on January 3, 1696, by his marriage in the previous year with Elizabeth, eldest daughter of Sir Edward Villiers, the first Duke of Buckingham's half-brother. Having been occupied for a while by Frederic, Prince of Wales, for whose entertainment there, on August 1, 1740, Thomson wrote in conjunction with Mallet the libretto for Arne's masque of "Alfred," all excepting the two wings of the house was burnt on May 20, 1795, and with it a set of tapestry hangings illustrating Marlborough's victories, wherein Lord Orkney had played a signal share. In 1819, the property, covering about 400 acres, was divided into seven lots for sale at auction, and some repairs were done to the buildings. But the mansion as we now see it was erected after a second fire of 1849, from the designs of Sir Charles Barry, architect, for the Duke of Sutherland. Barry left the old wings, rebuilding the central block in the Italian style, the front elevation (south), consisting of an engaged order of two stories with an unbroken entablature and a balustrade, standing upon a wider ground floor. The five day-rooms in this central block overlook the original raised terrace 135 yds. long, whence steps lead down to the lawn. Brick, coated with cement, was used. A whole-length plan and elevation, to scale, are given in Bishop Barry's life and works of his father: and a scale drawing of the central block in the *Builder* for July 6, 1850. A temple on the lawn was designed by Leoni in 1735; the water-tower by Mr. H. Clutton in 1861. Barry is said to have taken his general idea from old Somerset (Denmark) House, attributed to, *inter alios*, John of Padua, whom some take to be John Thorpe.

THE "Building Stones used in Edinburgh" is the subject of a paper written by an architect, Mr. George Craig, in the current number of the *Transactions of the Edinburgh Geological Society* (Vol. VI., pt. iv., p. 254). He observes that the Scottish capital has long been advantageously situated with reference to good building stones. The oldest known freestone quarries in the vicinity are those of Craigleith, Craigmillar, Salisbury Crags, Lochend, Bruntsfield, Ravelston and Quarryholes. Of these, the Craigleith occupied the chief place, and for a long series of years the public and private buildings of the New Town were almost entirely built with stone from this well-known quarry. Subsequently, Redhall, Binney and others were opened up, and although Mr. Craig says they are somewhat inferior in quality to Craigleith, they are regarded still as very good building stones. About the year 1860 Polmaise and Plean came to be extensively used. Gradually the stones quarried in the district have become practically worked out, or can only be obtained at a high price, so that in recent years Edinburgh architects have had to seek material farther afield. The author says, however, that there is still plenty of good sandstone to the west of the city that could be quarried without much difficulty. Within the last ten years pink stone from the New Red formation has come much into favour. Nearly all the building stones used in Edinburgh are sandstone, and, as the author observes, the weathering qualities of the rock depend upon the nature of the cement binding the grains of quartz together, which varies considerably in different beds, even in the same quarry. Speaking of the Craigleith quarry, he observes that it has an area of about seven acres, and is about 200 ft. deep; the zigzag road to the bottom is three-quarters of a mile in length. Particulars as to locality, geological position, chemical analysis, specific gravity, amount of water absorbed, crushing weight, weight per cubic foot, tint, texture, weathering qualities, and buildings wherein used, are given with each stone, as far as possible. Altogether, it is an interesting and instructive paper.

* For some particulars here given we are indebted to Mr. Clark's edition of Professor Willis's "Architectural History of Cambridge University."

THE recent case of the Queen *v.* the Tottenham Local Board of Health, which was decided by the Queen's Bench Division, is of interest, though it decides no new legal point. An attempt was made to obtain a Writ of Mandamus to compel the Local Board in question to construct a sewer. But as the Board had exercised their discretion, the Court decided the Writ could not issue. The practical point was, therefore, more interesting than the legal one. An owner of land built some houses along a lane. The owner was of opinion that the Local Board should construct a sewer down this lane to be connected with an outfall at the end of the owner's land. The Board, on the other hand, were of opinion that the owner should make this sewer at his own expense. The Local Government Board, to whom a kind of appeal on the facts had been made, agreed with the view of the Local Board. The practical difficulty which seems to arise from the decision, is that a Local Board can hand over duties which ought to be performed by a public body to a private person. For *primâ facie* it is the duty of a public body to make sewers into which the drainage of the houses can be conveyed. That there is some conflict between the fifteenth and one hundred and fiftieth sections of the Public Health Act 1875 on this point appears obvious, and this may require to be settled by legislation.

AT the last monthly meeting of the Manchester City Council, a question of considerable interest to architects was discussed. The Technical Instruction Committee brought forward a recommendation that the foundations of the proposed Technical Schools, and the brickwork of the basement, should be let by contract or by schedule of prices forthwith. Sir John Harwood at once moved an amendment "that no part of the works be commenced until tenders had been obtained for the completion of the building. No prudent man, he added, in building a house, would commit himself by laying the foundations before he knew whether the structure was to cost him 6,000*l.* or 10,000*l.* After several others members of the Council had spoken, Sir John's amendment was adopted, apparently without a division. We think the Council has done wisely, seeing that, according to the speakers, there is no need of haste in the erection of the buildings. In cases where rapid progress is imperative or where no limit of cost has been fixed, the foundations and basement may well be let separately. But in cases where a strict limit of cost has been fixed, and especially when the design has been selected in competion subject to such a limit of cost, it is only fair to the building owners and to the other competitors that the cost of the whole building should be known before any considerable amount of work is done. "A Manchester Architect and Ratepayer," writing to the *Manchester Guardian* on this point, instances the case of a church for which there was a competition, 6,000*l.* being laid down as the limit of cost. The successful competitor, "whose designs were accepted on his assurance that they could be carried out for 6,000*l.*, induced the committee to let him put in the foundations before the tenders for the whole were obtained. The church cost about, if not more than, double the stipulated amount." If the facts be as stated, and if the committee did not cause the increase of cost by requiring additions to be made to the original design, the architect's conduct was undoubtedly reprehensible, and the unsuccessful competitors had just cause for complaint. Other instances could be mentioned where preliminary contracts for foundations and basement have committed men to an expenditure far beyond their intentions. Such incidents reflect seriously upon the credit of the professional part of our art, and are likely to make committees think twice before they sanction contracts for only part of a building. They will prefer to wait, as at Manchester, until the cost of the whole is known. No reflection whatever appears to have been cast on the architects of the Manchester Technical School; it is a case of the whole profession suffering for the misleading estimates of some of its members. The just suffer for the deeds of the unjust.

REFERENCE has already been made in our columns to the current dispute between the Tilers' and Bricklayers' Unions as to the "right" of either body to execute tiling. We are glad to see that at a conference between the delegates of the two bodies at the Chamber of Commerce on Friday the 14th, the following resolution was agreed to:—

"That this Conference adjourns on the understanding that the Delegates will refer the questions asked them to their respective Unions, and that the Executive Committee of the London Labour Conciliation and Arbitration Board will be prepared to make suggestions to both parties to the dispute, and that the Delegates will recommend that hostile action on both sides should be suspended pending the adoption or rejection of such suggestions, modified or otherwise."

This is a more sensible course than quarrelling, so far. In the meantime we may suggest that, on the highest grounds, the right to execute the work belongs to those who can show that they can do it best, and that from that point of view ancient custom, one way or the other, is of very little consequence.

THE exhibition of the Society of Water-colours may be reckoned as one of the best that has been seen there. It is true that there is a large proportion of what may be called regulation work by old stagers of the society, who have occupied the same space on the walls for years, whose drawings seem the same every year except where they are deteriorating. This, in a "close" society, is a usual concomitant evil which cannot we presume be avoided. But the work of the best members of the more advanced *régime* is of the highest character. In particular, Mr. Alfred Hunt may be said to have surpassed himself in the delicacy and loving finish of his two principal works, "A South-country Manor-House" (113) and "Brignall Banks" (212); the latter is one of the most beautiful things we have ever seen in watercolour, giving the effect of the multiplicity of detail

of nature while escaping anything like hard realism. Both are works to be studied carefully; their full beauty and tenderness is not to be appreciated at a glance. Next to Mr. Hunt's one of the names we always look to first is that of Mr. A. Goodwin, who we are glad to find is continuing his efforts to illustrate Dante, as seen in the fine and imaginative work "Thence Came We Forth to Behold the Stars" (26); we say "efforts," as the complete realisation of Dante's conceptions in form and colour can hardly be regarded as within the possibilities of painting. The same artist's "Amalfi" (34) is a fine study of light effect. Mrs. Allingham's contributions are "A Source of the Wey" (80), "May on Hampstead Heath" (206), and "A Cottage at Freshwater" (231). Among architectural subjects is an interesting study of "Toledo" (5), by Mr. S. J. Hodson, and and a very fine broad painting of the "Court of Lions" at the Alhambra (85), by the impressionist member, Mr. Arthur Melville, whose very impressionist picture of the "Nile at Boulak" (166), whether we approve of the method or not, is a great success in its way, and a most refined bit of colour. Mr. Tom Lloyd sends a large work, "Ploughing on a White Frost" (14), in which we do not seem to be quite sufficiently conscious of the white frost; his "Anchor Inn" (27) is a charming river-side picture. Mr. L. Smythe's "An Impression—Boulogne-sur-Mer" (109), is not an impression in the impressionist sense, but a very realistic yet broad and free study of fisher-folk. Of Mr. Holman Hunt's extraordinary works, "Sunset in the Val d'Arno," and "Athens," we would rather say nothing; what the sunset is meant for one can understand, what is the meaning or the point of the "Athens" is utterly incomprehensible. Among fine landscapes are "The Road over the Downs to Littlehampton" (36), by Mr. Thorne Waite; "Lyme Cage, Cheshire" (16), by Mr. Eyre Walker, who has also surprised us by an excellent little picture study of a boy "In Wonderland" (190); "Kendal Fair" (73) a curious study of effect, by Mr. Cuthbert Rigby; "Oxwich Castle" (94), by Mr. E. A. Waterlow; two scenes on the Stort, by Mr. Eyre Walker (112, 118); "Beyond Blue Hills" (125), by Mr. North; "Königs Spitze from Sulden Thal" (170), a grand painting of a snow-covered mountain by Mr. Philip, and others which we have not space to mention. Mr. Walter Duncan sends several figure subjects, all marked by his individuality of style and fine sense of colour, though none of them showing quite what he *can* do; in his picture of "An Old English May-day" (192), he is to be credited with a humorous attempt to give what was probably the real truth about the boisterous and red-faced jollity of those days. Mr. Walter Crane's pretty decorative fancy, "Poppies and Corn" (180), is in his best vein, the poppy figure especially. Mr. Herkomer sends a small and very fine portrait of Mr. Briton Riviere (207). Among architectural works is a study in the Roman Baths at Bath, by Mr. Poynter (202); and among works of this class by able men are some which nevertheless we cannot accept as satisfactory; *ex. gr.* Mr. Hodson's "St. Mary-le-Bow" (95), which is too lanky in proportion; Mr. Herbert Marshall's "Hyde Park Corner" (61), which is hardly recognisable, and his "Trafalgar Square" (29), in which the front of the National Gallery is seriously misrepresented, and St. Martin's, moreover, is not in its right position in reference to the other building.

WE hear with great regret of the unexpected death of Mr. R. Herbert Carpenter, the senior partner in the firm of Messrs. Carpenter & Ingelow. Mr. Carpenter was a true artist in his work, which was always, however, characterised by a sobriety and restraint of style which was the more to be valued at a time when there is such a prevailing and conscious effort to be "picturesque" in architecture; and his own character and manner were as truthful and free from affectation as his architecture. He will leave many regrets behind him.

ROYAL INSTITUTE OF BRITISH ARCHITECTS:

EXAMINATION OF BUILDING STONES.

THE twelfth ordinary general meeting of this Institute was held on Monday evening last, Mr. Henry Currey, Vice-President, in the chair.

The Hon. Sec., Mr. William Emerson, read the result of the Preliminary Examination, held in March, to qualify for registration as Probationer of the Institute. Ninety-four gentlemen had passed, and their names and addresses, as well as the names of the gentlemen to whom they were articled, were read.

Mr. H. W. Burrows, A.R.I.B.A., then read a paper on "The Examination of Building Stones." He commenced by describing some of the leading types of structure in building stones, and their manner of origin. He described the characteristics of granite, sandstones, limestones, marble, and dolomitic or magnesian limestones. Before selecting a stone, its capability of resisting disintegration should be tested, whether such disintegration might arise from the action of the atmosphere upon the chemical constituents of the mass from the mechanical effect produced upon the stone by frost, wind, or other atmospheric and climatic agencies, or from the crushing strain to which the material might be subjected in the structure to be formed by it. It was often necessary to visit the quarries to ascertain that blocks of sufficient size could be obtained for the required work, and to note the depth of bed, particularly if it were proposed to use the material for columns. It had more than once happened that architects had expected to obtain long monolithic columns, in sandstones or limestones, where the depth of the quarry-bed was not sufficient to supply stones of the required dimensions. In such cases it became necessary to joint the columns, for, if due attention were not paid to that point, they might get to be erected as monoliths, with the planes of bedding vertical. The result of such a proceeding might prove disastrous if the load had been calculated for upon the resistance to crushing ascertained from stones bedded horizontally, the crushing strength being, of course, much less when the bedding planes are vertical. In the same quarry the beds of stone varied very considerably in disposition, texture, grain, and composition; some were hard, compact, and crystalline, while others were soft and incoherent. We might also notice the effect of weathering upon old blocks of the various beds, and would frequently find that they afforded valuable information as to the behaviour of the stone under climatic influences. We might compare the stone with similar material in structures of considerable antiquity, and note the effect produced upon it by the atmosphere. If we could feel assured of the identity of the stone with that we proposed to use, there was much to recommend that method of investigation; but as stones of very similar appearances were often vastly different in composition and structure, it was often a difficult matter to feel certain as to their identity. In any case a more detailed examination was to be preferred, and for that purpose certain tests were usually employed, which might be classed under two main divisions: (*a*) mechanical and (*b*) chemical. Of these he only proposed to discuss those regarded by most authorities as of importance—*e.g.* crushing weight, absorption, specific gravity, Brard's test, the acid test, Smith's test, and chemical analysis. Finally he would consider another, and, as he ventured to think, by far the most important method, that of microscopical analysis. Having dealt with the crushing strength of stones, the author referred to the absorption test, and said that, comparing the amount of absorption with the crushing strength, it would be found that as the absorption of water increased, the strength of the stone diminished, and *vice versâ*. It would also be noticed that limestones must be compared with limestones and sandstones with sandstones; for a like percentage of absorption in a sandstone and in a limestone did not necessarily indicate that they had the same crushing weight. This was perhaps to be accounted for by the fact that in many of the limestones the whole mass of the stone was more or less of an absorbent material, whereas in the sandstones only the matrix and the interspaces between the component particles could absorb water, the quartz or siliceous matter of the grains being non-absorbent. The more crystalline forms of limestone, the dolomitic varieties, for example, had a high crushing strength and a low absorbent rate. The broad fact could be stated that the ordinary non-crystalline limestones usually absorbed over 6 per cent. of their dry weight of water, and the sandstones under 6 per cent., and it would also be found that, with very few exceptions, the rise and fall of the crushing strength was synchronous with the decrease and increase of the absorption of water. It might even be suggested, the relationship being so close, that in very few instances need a crushing weight test be instituted, as the absorption test was sufficient to show the crushing strength. There was a considerable range of variation in the crushing strength in similar stone, and the absorption test would in nearly all instances indicate the strength well within this range of variation. It would be advantageous to bear that in mind in selecting untried stones when it was desired to employ local material. An inter-relationship undoubtedly existed in building stones between the absorption of water, the crushing strength, and the action of frost, and it was much to be desired that further experiments should be carried out to establish the connexion. Inferences drawn from the amount of absorption were more to be relied upon for indicating the possible behaviour of the stone under the action of frost than those to be deduced from a study of the crushing strength. Having treated of the specific gravity of stones, the lecturer described Brard's test, which consisted in subjecting the stone to the action of sulphate of soda. Small cubes were boiled in a saturated solution for half-an-hour. The stone was then dried in the air over the vessel in which it was boiled, so that any disintegrated particles might be caught. The process was repeated for four days, and the amount of stone forced off by the crystallisation of the salt in the pores of the stone was determined. Originally that test was supposed to imitate the action of frost on stones, but the late Mr. C. H. Smith had shown that sulphate of soda did not expand in crystallising, like water when freezing. Hence the action was of quite a different kind, and was one to which the stone would not be subjected by the ordinary processes of nature. Why not submit the stone directly to freezing mixtures if the action of frost was to be estimated? The test was essentially one requiring a comparative series of experiments to be of the least value. Isolated experiments here and there gave no indication of the relative behaviour of various stones. What was known as the "Acid Test" was described in Rivington's "Notes on Building Construction" as consisting in soaking a stone for some days in dilute solutions containing 1 per cent. of sulphuric acid and of hydrochloric acid, which, it was stated, would afford a rough idea as to whether the stone would stand a town atmosphere. A drop or two of acid on the surface of the stone would create an intense effervescence if there was a large proportion present of carbonate of lime or carbonate of magnesia. Certainly that was a rough test, for we should reject by it all the limestones, which would readily effervesce with the acid, and many of these were fairly durable, even in town. Mr. C. H. Smith's test consisted in breaking off a few chippings about the size of a shilling, putting them into a glass about one-third full of clear water, and after letting them remain undisturbed for at least half an hour, the water and specimens should be agitated by giving the glass a circular motion with the hand. If the stone were highly crystalline, and the particles well cemented together, the water would remain clear and transparent; but if the specimen contained uncrystallised earthy powder, the water would present a turbid or milky appearance in proportion to the quantity of loose matter contained in the stone. Very varying results could be obtained by that test, and at best it seemed only likely to indicate characteristics which could be as easily determined with the naked eye. Coming to the discussion of chemical analyses of stone, the lecturer said we constantly saw statements put forward by stone merchants and quarry-owners, giving the chemical composition of some particular stone. The point to which most attention was usually directed was the presence of silica, as that mineral was almost indestructible, and the inference was that, the higher the proportion of silica, the more durable the stone. If that argument were correct, we should be driven to the conclusion that all sandstones were, with hardly an exception, better than limestones, or even granites. If we compared the analyses of granites with those of sandstones, it would be found that the pro-

portion of silica was far less in the former. If we were to judge by that fact alone, we should come to the entirely erroneous conclusion that granites were far less durable than sandstones. Comparing analyses of sandstones with those of limestones, we should invariably find, as would be expected if the origin of the rock were considered, that the proportion of the nearly indestructible constituent — silica — reached a higher percentage than in the limestones, 8 to 10 per cent. of silica in the latter being seldom found. Chilmark, for example, had 10·4 per cent., and Totternhoe stone 8·5 per cent.; while in many of the best known and most valued limestones, such as Portland, the proportion of silica did not exceed 1¼ per cent., the bulk of the residue being carbonate of lime. Comparing analyses of limestones with each other, we should still find that the proportion of silica afforded no guide whatever as to the weathering capabilities of a stone. The grey chalk of Folkstone had an insoluble residue of 3·61 per cent., and the bulk of that was silica; but such excellent weather-resisting stones as Barnack, Ancaster, and Ketton had no silica. Thus any inference drawn from the presence of silica was not to be relied upon unless supported by something beyond the facts supplied by chemical analysis. Before we could arrive at any satisfactory conclusion as to the weathering properties of a stone, it was absolutely essential that its state of aggregation should be ascertained. Having dwelt on this point at some length, the lecturer proceeded to call attention to the value of microscopical examination. He said that to ascertain the capacity for resistance to weathering, it was far more important to understand the manner in which the component grains of the stone were bound together, than to discover the composition of either the grains in detail, or of the rock as a whole. The nature of the cementing material and its disposition around the particles of which the rock was formed, or the state in which the crystals, or grains of the rock occur, should be the chief objects of inquiry, for as a rule it was to this, far more than to the chemical composition, the rock owed its strength and durability; to ascertain that we must resort to microscopical investigation. For that purpose portions of the stone were fixed to glass slides by Canada balsam, and were then ground down till they were transparent. That method of investigation was first used for rock sections by Dr. Sorby in 1856, so that it was unknown to the Royal Commissioners who, in 1839, inquired into the question of selecting stone for the new Houses of Parliament; if it had been known, the lecturer believed it would have been used in preference to the chemical and physical methods adopted, not absolutely supplanting them, but very considerably enhancing their value. With a transparent section of the stone, ordinary transmitted light was sufficient to show the structure of the material, and the disposition of the component particles and matrix. But a far more delicate investigation was also possible by the use of a polariscope. If we passed rays of light through a singly refracting mineral, such as glass, under the polariscope they were apparently unaffected. Bodies which acted in this manner were said to be isotropic; on the other hand, doubly refracting minerals affected the polarised rays of light, and such bodies were said to be anisotropic. The polarised rays of light were affected by different minerals in a characteristic and peculiar manner, so that it had been possible to draw up tables indicating the characteristic behaviour of most rock-forming minerals. Quartz, for example, showed a characteristic brilliant chromatic polarisation, while calcedony displayed a minute concentric radial structure. Calcite again, a very common constituent of building stones, showed characteristic iridescent tints of grey, rose, and blue. We had thus a means of detecting the differences in structure, even in minerals which, like quartz and calcedony, were chemically identical. Further, the alteration produced upon the component minerals by weathering or decay could be detected. In conclusion, the lecturer, by means of photographic lantern-slides of sections of various stones, highly magnified, pointed out the differences of structure. These sections and slides, t should be mentioned, had been specially cut and photographed for the occasion. The paper, which was also illustrated by numerous tables and diagrams, will be published *in extenso* in the forthoming number of the *R.I.B.A. Journal.*

In the discussion which followed,

Mr. P. Gordon Smith, vice-chairman of the Science Standing Committee, said that in the absence of Mr. Lewis Angell, chairman of that committee, he wished to say a few words expressive of their thanks to Mr. Burrows for the remarkable and instructive paper which he had read that evening. The importance of the subject to them as architects was very great, and as he watched the exhibition of lantern slides he could not but be struck with the advance which had taken place within the last fifty years in the methods of examining building stones. The discussion which had recently taken place about the relative advantages of building stone and terra-cotta had brought the subject of stone rather prominently before them, and he could not but think that the absence of sufficient knowledge on the subject had led in many cases to the abandonment of the use of stone in favour of terra-cotta. He was brought up a good deal amidst masonry, and when he looked at the workmanship which was displayed in terra-cotta he could not but think that a mason would be very dissatisfied with the character of the work turned out in terra-cotta. Quite apart from any question of colour, ornament, or enrichment, the mere masonry, if he might use the term in connexion with terra-cotta, was exceedingly bad, and he, for one, looked forward to going back to the use of stone when they could ensure its durability, of which he thought there was now some prospect.

Mr. F. W. Rudler, F.G.S., Curator of the Museum of Practical Geology, Jermyn-street, said that, speaking from the point of view of a geologist, he begged to be permitted to express satisfaction that a method of microscopial examination of rocks, introduced originally for purely scientific purposes, should turn out to be a servant of some little value to the architect. There could be no manner of doubt that the examination of a thin slice of rock, highly magnified in transmitted light, offered an insight into the minute structure of that rock utterly unobtainable by any other method. He supposed that very few of our building stones had been examined with any approach to exhaustiveness, and he thought that they would all be deeply obliged to Mr. Burrows if he could pursue his investigations further. There had been several references made to the report of the Commissioners for selecting the stone for the Houses of Parliament, but it should be remembered that nearly fifty years had slipped by since that report was issued. The commissioners of that date were for the most part geologists, rather than physicists or chemists, and the examination to which they subjected the stone selected was not exhaustive. It was not given to them to throw upon the stones they examined the powerful search light of the microscope. After the meeting of the British Association in 1838, the Commissioners purchased an old carriage and drove across the country for three months selecting samples, and these samples formed the nucleus of the collection of building stones in the Jermyn-street Museum. There were now upwards of 600 specimens. That collection, although he believed it to be the best in the country, was very far from perfect, and he looked forward to the assistance of Mr. Burrows and his friend Mr. G. F. Harris, to make it more complete. Mr. Burrows had shown that chemical analysis, even of the most refined character, was open to grave misinterpretation. He (the speaker) would not altogether discourage chemical analysis, but he thought that chemical analysis and microscopical examination should always go hand in hand.

Mr. Henry Dawson, in moving a vote of thanks to Mr. Burrows, said that as a member of the Science Standing Committee he was able to say how greatly that Committee felt themselves indebted to Mr. Burrows. He was afraid, when he first saw the title of the paper, that it was going to be devoted to a crusade against chemical analysis, and to an undue exaltation of microscopical examination, but he was very glad to find that both Mr. Burrows and Mr. Rudler recognised some utility in chemical analysis. For his (the speaker's) own part, he considered chemical analysis to be just as valuable as microscopical examination. He referred to certain of the tables exhibited on the walls in support of this view, more particularly with reference to the amount of silica in stones.

Mr. G. F. Harris, F.G.S., said he had listened with great interest to the paper which had been read by his friend Mr. Burrows, because, from its very inception, they had discussed the matter together. He was not surprised to find Mr. Burrows advocating the microscopical analysis of stone, for, in his opinion, that was the only reliable method for the examination of building stone at present extant. While listening to what the last speaker had said as to the importance of chemical analysis, and when he heard him reiterating the old story of the proportion of silica in stone as indicating its durability, his mind's eye reverted to a past age. That very same question, when it was first put to him (the speaker), was practically disposed of some six or seven years ago. If we studied very carefully the work which had been done with the microscope, especially in America, for ascertaining the durability of building stone; if we examined such remarkable works as those of Professor Winchell, of Minneapolis, and of Mr. George Merrill, of the United States National Museum at Washington; if we examined, too, the work which had been done in Germany, and in the experimenting rooms and laboratory at Paris, he thought that no one who had given much attention to the subject would for one moment come forward and make the statement that chemical analysis was anything like as important as microscopical examination. On the other hand, he should be very sorry indeed to say that chemical analysis was of no use whatever. First of all they had to determine the chemical composition of the mineral, and they could then identify the latter under the microscope. If that was the only thing, however, that the microscope could teach us, it would be of no earthly use whatever in the inquiry; but when one examined into the stages of decomposition of the various minerals, and considered practically the way in which the stones weathered, there the great value of the microscope was at once apparent. With the aid of the microscope he had examined specimens of stone from various buildings, and he had observed the peculiar conditions under which the minerals had been formed, or had decomposed, and had noted why the stones had absolutely given way or been preserved, as the case might be. He had divided stones into various stages of decomposition. If they took one mineral, calcite, which was the carbonate of lime in crystalline form, they would find that under varying circumstances it weathered in totally different manners—he did not now allude to it when it was in its amorphous condition, but he alluded to it as it was found in oolitic building stones, in which it usually existed in the form of crystalline granules partly decomposed. It was really on the state of decomposition of the minerals, as seen under the microscope, and on the manner of their association one with the other, that the durability of the stone depended, and only by the aid of the microscope could the conditions referred to, be observed and noted. He was, therefore, very glad to hear his friend, Mr. Burrows, so strongly advocating the use of the microscope in estimating the value of building stones.

Mr. W. Topley, F.R.S., said he only wished to express his warm thanks to Mr. Burrows and Mr. Harris for their remarks. He quite thought that to the great majority of architects this microscopical examination of stone would be of great value. The great advantage of microscopical examination was that it showed so much at once; it showed us a great deal of the chemical composition of the stone, and of its physical character; and we could practically learn its porosity, for if we took sufficient note of the constituents, we could find its specific gravity. By the microscopical examination of stone, then, they could learn the larger proportion of the results obtained by the more laborious methods.

Mr. William Emerson, Hon. Sec., seconded the vote of thanks to Mr. Burrows, and expressed his gratification at the presence of Mr. Rudler, of the Museum of Practical Geology. Excellent and valuable as was the collection of building stones in that museum, it was practically useless to the architect, because no particulars were given as to the properties of the stones of which specimens were exhibited. If only Mr. Burrows, or some other gentleman, could schedule the various properties and capacities of the various stones, it would be of great advantage to architects.

Mr. Middleton suggested that a series of tests of the behaviour of stone under frost should be undertaken by the Science Standing Committee.

Mr. J. M. Brydon said it would be interesting to know what were the best building stones for ordinary use by architects, especially in London.

Mr. William Woodward having made a few remarks,

The Chairman, in putting the vote of thanks, expressed regret that there was not time to discuss the subject any further that evening, but on the question raised by Mr. Brydon, as to the best stone for external use by architects, especially in London, his (the speaker's) old-fashioned experience was that there was nothing like Portland stone.

Mr. Burrows, in the course of his reply,

thanked the meeting for the patience with which they had listened to his long paper, and expressed his acknowledgments to Mr. Harris, to whom he owed a great deal of his knowledge of the subject. With regard to Mr. Dawson's observations, the presence of silica in building stone was no criterion of the value of the stone. He by no means advocated the giving up of chemical analysis altogether, but he did maintain that such analysis was capable of being strengthened and confirmed by microscopical examination.

The meeting then terminated with the announcement that the annual general meeting would be held on May 1.

COMPETITIONS.

BOARD SCHOOL, SUNDERLAND.—A special meeting of the Sunderland School Board was held on Tuesday last to consider competitive plans for Chester-road School. Nine plans had been sent in under various mottoes, and the General Purposes Committee recommended that the first premium of 50*l.* be awarded to "Red Cross," the second premium of 30*l.* to "Apropos," and the third premium of 10*l.* to "Left-hand Light," each of whom certified that their plans could be carried out for the sum specified by the Board, viz., 9,800*l.*, inclusive of commission. Mrs. Hancock proposed as an amendment, Mr. Singleton seconded, and it was carried by 6 to 3, that the first premium be awarded to "Apropos." On the motion of Mr. Davison, seconded by Mrs. Hancock, the second premium was awarded to "Red Cross," and the third to "Left-hand Light." The Clerk then opened the sealed envelopes, upon which it was found that the first premium had gone to Messrs. Oliver & Leeson, Bank Chambers, Moseley-street, Newcastle; the second to Mr. Geo. T. Brown, Fawcett-street; and the third to Mr. John Eltringham, Sunderland.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday afternoon at Spring-gardens, the Chairman, Mr. John Hutton, presiding.

Resignation of the Newly-Elected Alderman.—The Clerk read a letter from Mr. J. Fletcher Moulton, Q.C., who wrote to thank the Council for having elected him an alderman, and to explain the singular position in which he found himself. The fact of his holding retainers on behalf of the Council might be deemed sufficient to invalidate his election, as it could be held to involve personal interest. The point was a very difficult one, upon which he could find no authority. He had decided to take no fees for any matters subsequent to the date of his election. That put him right as to the future, but it did not perhaps apply to what had actually taken place, and feeling as he did that no doubt should be allowed to exist as to the validity of an election, he thereby tendered his resignation, enclosing the statutory fine of 1*l.* for so doing. The office of alderman was then formally declared vacant.

Workmen's Trains.—The Council considered and adopted a report from the Public Health and Housing Committee on the subject of workmen's trains. The Committee recommended that the Board of Trade should be requested to convene a conference, in order to discuss a basis of common action on the part of the railway companies in relation to the zone limit and tariffs; that the Board should exercise its powers under the Cheap Trains Act of 1883, and introduce an amending Act if those powers were insufficient; that the Great Western Railway Company should be required to provide an adequate service of workmen's trains to Southall; and that superior cheap trains at half-fares should be run to all the London termini from 7 to 9 a.m., without restrictions as to time of return. The Committee further suggested a model clause for insertion in all Bills relating to new metropolitan railway undertakings, and for adoption by existing railways in any proposed amendment of the Cheap Trains Act, 1883, to meet the views of the Committee as expressed in their Report.

Mr. Beachcroft, the Chairman of the Committee, in moving the adoption of the Report, said that what the Committee wanted was to bring about the zone system, which would be of advantage to the working classes of the metropolis and to the railways themselves. In the thirteen metropolitan companies he found the mean rate per mile varied from one-tenth to one-fourth of a penny, whilst the maximum charge ran from one-third to three-fourths of a penny per mile. He was afraid they could not hope for a universal 2½d. fare, such as existed in New York; but they could hope for a uniform system applying to the 5,000,000 of the population, of whom 3,000,000 belonged to the working classes. As far as he could gather, only 70,000 persons used the workmen's trains. The companies were realising that their profits lay with their third-class passengers, but they had yet to learn that full trains at cheap fares were better than half-empty trains at high fares. The Committee proposed the rate of one-fifth of a penny a mile. They practically proposed three zones, at rates equivalent to one-fourth of a penny for the first zone, one-fifth for the second, and one-seventh for the third; and, in fixing twenty miles as the limit, he might remind them that some workmen's trains already ran up to nineteen miles. What the Committee wished to promote was suburban segregation instead of urban congregation.

Proposed Improvements.—Mr. Charles Harrison, Chairman of the Parliamentary Committee, brought up a report from that Committee pointing out that the London Improvements Bill was down for second reading on the 24th inst., and intimating that up to the present time there had not been any expression on the part of the Government of an intention to provide relief to the occupying ratepayers of London in respect of the burden which the execution of the improvement schemes would involve. The primary condition attached to the resolutions of the Council to seek powers for the Strand improvement and the Tower Bridge approach was, that the scheme should not be proceeded with unless satisfactory provisions were made for payment for them other than by the occupying ratepayers. They were informed by the Members of Parliament having charge of the Bills that Parliament would require some expression of opinion from the Council as to whether the primary condition attached to all the schemes, and whether they all stood on the same footing. Important as the Strand to Holborn improvement was, it could hardly be described as of an urgently pressing character, and having regard to the very large burden which its execution would entail upon the occupying ratepayers in the absence of any satisfactory relief, they submitted that the Council might be advised to postpone it for the present. They recommended

(*a*) "That the provisions relating to the new street from Holborn to the Strand, and the subsidiary streets, be withdrawn from the present Bill.

(*b*) That, notwithstanding any previous resolutions of the Council, the provisions relating to the Tower-bridge approach be retained in the Bill.

(*c*) That the provisions relating to the rebuilding of Vauxhall-bridge be retained in the Bill.

(*d*) That the provisions relating to the Rotherhithe and Ratcliff Ferry be withdrawn from the Bill."

The Committee further recommended (*e*) that the provisions relating to the southern approach to the Woolwich Ferry be withdrawn from the Bill; (*f*) that the clauses relating to the widening of Wood-lane, Hammersmith, be retained; and

"(*h*) That, notwithstanding any resolutions of the Council to the contrary, the second reading of the Bill, with the omission of the schemes referred to in this report, be proceeded with, and that the Members of Parliament having charge of the Bill be requested to inform the House of the intention of the Council to withdraw such portions of the Bill as relate to the particular schemes which the Council may resolve to withdraw, and that the Bill when amended be prosecuted in the usual way, with a view to its passing into an Act."

Recommendations *a*, *b*, *c*, *d*, *f*, and *h*, were agreed to, but *e* was rejected.

After sitting for nearly five hours and a half the Council adjourned.

LICENSED VICTUALLERS' ASYLUM.—A marble tablet has been recently unveiled in the chapel of this institution, Old Kent-road, to the memory of the Rev. William George Martin, M.A., the first chaplain, who officiated there from the time of its erection, in 1850, to the date of his death, April 9, 1892. The memorial consists of a white statuary marble panel, 2 ft. 6 in. by 2 ft., enclosed in ornamental framing of the same material, supported on white marble brackets, caps, and bases, and Sienna marble shafts and four brackets over the same, the whole surmounted by a pediment enclosing a carved tympanum, consisting of a circular garter or ribbon, and shield and scroll-work. On the shield is the monogram of the deceased, "W. G. M.," the total dimensions being 6 ft. by 4 ft. The work was executed by Messrs. H. W. Wilkins & Sons, Pentonville Hill, from designs by Mr. W. F. Potter, architect to the institution, in Classic Renaissance style, to harmonise with the chapel and Asylum. The tablet is fixed on the right of the stained-glass east window, which was illustrated and described in the *Builder* of March 27, 1875.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

TWO CHURCHES IN SOHO-SQUARE.

ON Saturday last a numerous party of members of the Architectural Association visited Soho-square, primarily to inspect the new church recently completed, from the designs of Mr. Aston Webb, for the French Protestant community who are the descendants and representatives in London of the Huguenot refugees of the fifteenth and sixteenth centuries. The visitors were met by Mr. Aston Webb, who gave a short account of the history of the body for whom the church has been built, and who originally possessed what is now the Dutch church in Austin Friars. The new church in Soho-square being carried out in terra-cotta, Mr. Webb, in view of the recent discussion, gave his reasons for employing the material, the chief being that his clients are a congregation with limited income, and therefore with no available funds for constant repair or decoration; hence he considered that a terra-cotta building, which would need no more than an occasional washing, would be most suitable. As regards the comparative cost of terra-cotta and stone, Mr. Webb stated that the building could have been carried out with Bath stone if the enriched detail which must have been carved in stone had been omitted. This illustrates what we believe to be the true state of the case; if an architect designs his building with a large amount of enriched and repeated ornament, there can be little doubt that this can be done at a less cost in terra-cotta than in stone. In respect of durability there is little advantage on either side, given the best quality of either material. There are plenty of examples of even Bath stone in London, where work executed thirty or forty years ago is in excellent preservation; there are, of course, plenty of failures also, even in Portland stone. So with terra-cotta, there is good and durable material, and bad and perishable material. Then as regards appearance, the question is entirely one of taste or individual preference, and *de gustibus non est disputandum*.

Returning to Mr. Webb's design, it is notable how much the church reflects the feeling of St. Bartholomew's, Smithfield, notwithstanding the character of the detail, which is clearly based upon the French work of the time of the Huguenot immigration. The difficulties of the site in respect of lighting and ancient lights have been considerable, and have had much to do with the main lines of the design, the narrow nave and lofty clearstory, the top-lighted aisles and the apsidal chancel. The end of the site next the square is occupied by the pastor's house, and hence the elevation is somewhat domestic in character, though the fact that it forms the front to a church is indicated by the entrance and gable. The red terra-cotta used here forms, we think, a pleasing combination with the dark purple of the Luton bricks. We are hardly, individually, satisfied with the precise tint of the buff terra-cotta used internally, but there can be no doubt that, given terra-cotta as the material, the design and detail are admirably suited thereto. We may add that we gave a view of the church in the *Builder* for June 27, 1891.

Leaving the French Protestant Church the members proceeded to the new Irish Catholic Church of St. Patrick, where they were met by the architect, Mr. Kelly, whose design was selected in a limited competition. This church is a great contrast in every way to that on the other side of the square. Its campanile in red brick, and its exterior basilica-like treatment prepare one for and are part of the Italian character of the design. Unfortunately the design has suffered from the trouble of ancient lights, through which the length is shortened to such an extent as to spoil the proportions of what would have been a very fine church. Even now the aisle-less nave, with its semi-circular barrel ceiling, will be very impressive when the colour decoration is complete. At present only the ceiling is coloured, and the walls with their pilasters and other features are in bare white plaster. In this, as in all else, the church of the Irish Catholics differs from that of the French Huguenots; the former expect and intend to continually add to the beauty of their church, the latter expend their capital and have no hope of income for material purposes.

A LARGE STEAM COOKING APPARATUS.—The Brighton Board of Guardians have accepted a tender of Messrs. Comyn Ching & Co., for the erection of an improved steam cooking apparatus, capable of supplying 1,500 people, at the Brighton Workhouse.

Illustrations.

TOWER AND SPIRE, ST. MICHAEL'S, COVENTRY.

AT the time of the death of the late Mr. John Drayton Wyatt we mentioned, in an obituary notice of him, that among other things he had at considerable trouble and risk, made a large and very careful measured drawing of the spire of St. Michael's, Coventry. This illustration is a reproduction of that drawing, with the plans of the different stages. The original drawing, lent to us by Mr. O. C. Wylson, is on a very large scale, six or seven feet high.

The words "Section, looking south" appear to have been inadvertently written on the original drawing in the wrong place, as they are reproduced here beneath the elevation.

SEATON DELAVAL HALL, NORTHUMBERLAND.

BLENHEIM PALACE, Oxfordshire, and Castle Howard, Yorkshire, are both well known and celebrated examples of the genius of Sir John Vanbrugh. There is, however, a comparatively forgotten and unknown mansion situated in a far remoter part of the country, designed by this architect, viz., Seaton Delaval Hall, Northumberland.

Although much smaller in scale and less ambitious in design than the others beforementioned, it can justly lay claim to be one of Vanbrugh's most successful works.

The Delavals, who owned the estates, were one of the oldest families in the North, and their name is connected with some of the most important events in English history. They figure more or less in every period, from the time of the Conquest to the Revolution.

The ancestral home of the family was in the Province of Maine. Howard de Laval and his son Guy came over with the Conqueror, whose niece Guy married. During the tyrannical reign of John, we find Gilbert de Laval took up arms against the King, and was with the barons at Stamford at Easter, 1215. Hugh, Lord de Laval, was a man of great note and influence in his day, during the time of the Scotch and French wars of Edward I.

Passing on to later times, we find some record that throws light on the ancient ancestral hall of the Delavals.

In the will of Sir Ralph Delaval, who died in November 24, 1628, is mentioned an inventory of the contents of the several halls, chambers, galleries, nurseries, kitchens, &c., from which we may gather some idea of the vast extent and ample accommodation of the old feudal castle, which previously existed on the site of the present mansion.

To Admiral Lord Delaval we owe the erection of the Hall in 1707.

After spending many years in the naval and diplomatic services, and having amassed great wealth, he commenced the building of this mansion from the designs of Sir John Vanbrugh.

Sir Francis Blake Delaval completed the building. It was he and his brother Lord Delaval whose mad escapades and reckless extravagance made the name of the family notorious.

The family became extinct in the year 1814, and the entailed estates passed on to Sir Jacob Astley. They are now held by the present representative of that family, Lord Hastings.

The Hall is finely situated amid a well-wooded domain, about a mile from the Northumbrian coast. Although in the centre of the Northumbrian coal-field, yet the collieries and the pit villages have failed to entirely rob its surroundings of their charms as seen from the coast.

The Hall is approached from Seaton Delaval station, through a long avenue of trees, with massive gate pillars at the entrance, now fast falling to decay. Between the Hall and the coast is the quaint old-world village of Seaton Sluice, with its deserted harbour and bottle works, relics of more prosperous days under the Delaval family during the seventeenth and eighteenth centuries.

The first appearance of the Hall is very striking. In the centre is the principal block, containing the chief apartments, flanked on either side by wings containing other rooms and the stables. These buildings form a large courtyard, with colonnades connecting the whole together. This is a fine feature in the general arrangement and design.

The stables in the east wing consist of a pacious building 62 ft. long and 41 ft. wide, with a lofty roof supported by three segmental arches, 21 ft. long.

The stalls are quite unique, with divisions massively constructed of stone; over each are plates containing the names of famous racehorses kept here previous to the fire.

The west wing, which at present contains the principal apartments, was burnt down on May 6, 1752, but was rebuilt on the same lines.

The principal block in the centre was burnt out on January 22, 1822, leaving, however, the main features of the structure intact. After the fire the roof was recovered and the windows reglazed; with these exceptions, the building remains in pretty much the same state as it did after the conflagration. To-day it is a splendid ruin, with blackened walls inside, though the general effect of the exterior is the same as seen after its completion by Sir John Vanbrugh.

The north elevation is a bold composition on a massive base. In the centre is the principal entrance, approached by a broad flight of steps, giving easy access to the doorway. On either side are Doric columns with enriched entablatures. The pediment above is richly decorated with Delaval arms—"Ermine, two bars *vert*; crest, a ram's head erased *argent*, attired *or*; the motto, 'Dieu nous conduite.'" These are quartered with various alliances of the family. The shield is surrounded by mantling and trophies of various kinds.

At each angle of the block are octagonal bays, surmounted by balustrades, and behind are towers containing the staircases.

The south elevation is similar to that of the north in general grouping and design, with the exception of the centre portion, which consists of a beautiful tetrastyle Ionic portico, surmounted by a balustrade which runs along the entire front.

The principal entrance doorway on the north opens into the hall, a fine but ruined interior, 44 ft. long by 25 ft. wide and 44 ft. high. The havoc wrought by the fire is here very apparent. The original ceiling is destroyed, and only the holes of the timbers mark its place. Two rows of arcades are formed in the thickness of the wall on each side; those in the upper story form niches for mutilated statues representing Music, Painting, Geography, Sculpture, Architecture, and Astronomy. At the end of the Hall is the music-gallery, with an enriched stone entablature, supported on beautiful consoles and surmounted with a wrought-iron balustrade of very chaste design, though very much rusted and twisted from the effects of the fire. The fire-place is very massive, with caryatides supporting a sculptured frieze.

The floor is paved with black and white marble slabs placed diagonally across the apartment.

Leaving the hall you enter into the grand saloon, 68 ft. long by 25 ft. wide, which occupies the whole of the south front.

This fine apartment is, however, a mere shell of its former grandeur. It is open to the roof. Nothing but blackened walls and fragments of Corinthian pilasters and caps are to be seen.

Spacious corridors from the hall communicate with the other apartments and staircases in the towers. These latter are beautifully constructed in an elliptic-shaped well, forming spiral steps with wrought-iron balustrading.

Below in the basement are the cellars, formerly used for domestic purposes. They are groined in stone, and very massively constructed.

A short distance from the Hall is the mausoleum, erected by Sir John and Lady Hussey Delaval to their only son, who died in 1775. It has a Doric portico and leaden covered dome. The building, however, has never been used for the purpose originally intended.

To the south-west of the Hall is the quaint old Chapel of our Lady (recently made a parish church). This interesting structure is planned on typical Norman lines, with nave, choir, and chancel, with a total length of 48 ft. The chancel and choir arches, with zigzag mouldings and biletted labels on cushion capitals, are the principal features of architectural interest.

In the chancel are two recumbent effigies of some crusading knight and his lady. There are also a few old pennons and hatchments hung on the walls.

J. W. TWIST.

CHURCH AND RECTORY, CARLISLE.

THE plan of the church consists of a nave and chancel of equal width, 21 ft. within the columns, and 102 ft. long. At the west end of the nave, and opening from it by an archway reaching nearly to the roof, is the tower, making a total internal length from west to east of 122 ft. There are north and south aisles, each having a chapel at the east end, respectively 91 and 86 ft. long. The total width of the church across nave and aisles is 52 ft. At the west end of the south aisle is the baptistery, separated from the church by an archway. The principal entrance is at the west end from Warwick-square, opening into a porch under the tower. A staircase from here gives access to a gallery in the next stage of the tower, capable of seating more than fifty persons. A second entrance is provided, having an external porch opening into the south aisle. Adjoining the chancel are two sacristies, 15 ft. by 15 ft., and 20 ft. by 15 ft. A special staircase leads to two rooms of the same dimensions above; the smaller one is an organ-loft, with an archway opening into the chancel. An entrance is provided at this point from Warwick-square east, giving access to the sacristies and organ-chamber, and being also a side entrance to the rectory.

The rectory joins the building last named, and provides accommodation for three priests, with one spare bedroom and a bathroom, also the usual outbuildings and offices. The main entrance is from the garden, on the west, and there is another, through the kitchen yard, on the east.

The design of the church is in the Perpendicular style, and it is being carried out in the redstone of the neighbourhood.

The ceilings of nave, chancel, and aisles are of panelled woodwork.

Sitting accommodation is provided for 732; and the total cost of church, sacristies, and rectory will be about 10,000*l*.

NO. 18, BISHOPSGATE-STREET, WITHIN.

THIS building, which has a narrow frontage to Bishopsgate-street, was planned for letting out in suites of offices, which are partly lighted from a central area—these are supplied with a passenger-lift from first to top floors.

With the exception of the ground floor, which is in polished Cornish granite, the whole of the front is in terra-cotta, which was supplied and fixed by Messrs. Doulton, the modelling of the panels being designed and carried out by the late Mr. R. A. Ledward.

The flooring is fireproof throughout, and laid by Messrs. Homan & Rogers, the general contractors being Messrs. Lascelles, of Bunhill-row. The architects were Messrs. W. E. & F. Brown.

ARCHITECTURAL SOCIETIES.

MANCHESTER SOCIETY OF ARCHITECTS.—The annual meeting of this Society was held at the rooms of the Manchester Literary and Philosophical Society, 36, George-street, the President, (Mr. Salomons) in the chair. The annual report was read and adopted. The following gentlemen were elected as officers and members of Council for Session 1893 and 1894:—President, Mr. Edward Salomons; Vice-presidents, Mr. John Holden, Mr. W. A. Royle; Hon. Sec., Mr. Paul Ogden; Assist. Hon. Sec., Mr. Edward Hewitt; Members of Council—Messrs. A. H. Davies-Colley, T. Chadwick, John Ely, R. Knill Freeman, F. Mee, J. D. Mould, James Murgatroyd, J. H. Woodhouse, T. Worthington (Fellows), and Messrs. P. Hesketh, J. S. Hodgson, and H. E. Stelfox (Associates); Auditors, Messrs. Henry Bridgford and P. E. Barker; Education in Architecture Committee—Messrs. A. H. Davies-Colley, T. Chadwick, John Ely, F. Mee, J. D. Mould, J. H. Woodhouse (Fellows), and Messrs. P. E. Barker, P. Hesketh, E. P. Hinde, J. S. Hodgson, H. E. Stelfox, and P. S. Worthington (Associates).

EDINBURGH ARCHITECTURAL ASSOCIATION.—On the 12th inst. a meeting of this Association took place in the Royal Institution—Mr. W. W. Robertson, the President, in the chair. Mr. A. H. Millar, F.S.A. Scot., read a paper on "The Old Howff of Dundee," on many of the monuments and their inscriptions in which burying-ground he commented, and illustrated them by means of the limelight. He traced the origin of the cemetery, pointing out that the orchard of the Franciscan monastery had been granted by Queen Mary for that purpose in 1567, and that for three hundred years afterwards the "Howff" (which had been so named from the fact that up to 1778 it was used by the crafts as their meeting place) continued to be the chief place of interment in the town. Consequently the sacred spot was peculiarly rich in memorial stones, indicating the alterations that had from time to time taken place in the artistic tastes of the community. At the close of the lecture a cordial vote of thanks was passed to Mr. Millar.

THE BUILDERS' CLERKS' BENEVOLENT INSTITUTION:

FIFTEENTH ANNUAL DINNER.

THE fifteenth annual dinner in aid of the funds of this Institution was held on Tuesday evening last, in the large hall of the Cannon-street Hotel, when 250 of the members and supporters of the Institution sat down to table. The president of the Institution, Mr. William A. Colls (of the firm of Colls & Son), was in the chair.

The usual loyal and patriotic toasts having been honoured (Mr. James Hill proposing "The Army, Navy, and Reserve Forces," coupled with the name of Captain E. C. Roe),

The Chairman rose to propose the toast of the evening, "The Builders' Clerks' Benevolent Institution." He said he had great confidence in proposing that toast, for the Institution was a most deserving one, and was managed very economically, thanks to the zeal of their indefatigable Secretary (Mr. Wheatley), their equally indefatigable Treasurer (Mr. E. Brooks), and their business-like and assiduous Committee. The income of the Institution last year was 686*l.*, made up of annual subscriptions, 265*l.*; donations, 300*l.*; and dividends, 120*l.* The expenditure last year was 445*l.*, including 337*l.* paid for pensions, and 20*l.* for temporary relief. The Institution now had seventeen recipients of pensions on its books, while the total number of pensioners elected since the foundation of the Institute was thirty-five. The Institution had invested the sum of 4,150*l.* in 2¾ per cent Consols, but he and the Committee would very much like to see that amount increased. Since the date of the establishment of the Institution the aggregate income had been 12,980*l.* The amount expended in relief had been 5,270*l.*, and three presentations to the Orphan Working School had been purchased, at a cost of nearly 800*l.* There was one vacancy for an orphan at the present time, and the Committee would be glad to hear of any qualified applicant for it. Last year the income of the Institution from subscriptions and dividends was only 265*l.*, and as the expenditure amounted to upwards of 420*l.* they had to take 160*l.* out of the sum received in donations at the last annual dinner; therefore, it would be seen that it was a matter of some importance that the amount of the subscription list should be large, and not wholly dependent upon the Chairman's eloquence in advocating the claims of so excellent an institution. But while he appealed to his hearers to be generous, he confessed that he should be glad to see the Institution better supported than at present by builders' clerks themselves. He knew that their means were not large, but he thought that if they considered the matter they would find it to be to their advantage to subscribe to the Institution. In conclusion, he asked the company to unite with him in drinking heartily to the success of the Institution.

The toast was very cordially received.

Mr. J. Howard Colls, in proposing "The Architects and Surveyors," referred to the controversy as to whether architecture was an art or a profession. However that question might be decided, it was incontestable, he thought, speaking as a builder, that the architect should be a man of business, whatever else he might be; and he was happy to think that there were many architects who united business aptitude to artistic instincts. With the toast he had great pleasure in coupling the names of Mr. T. Chatfeild Clarke and Mr. Ellis Marsland, who both responded to the toast in interesting speeches.

The other toasts included "The Builders," proposed by Mr. S. Nicholls and replied to by Mr. Joseph Randall; "The Merchants," proposed by Mr. W. Scrivener, and responded to by Mr. Fred. Hunter; "The Past Presidents," proposed by Mr. Edwin Brooks, and coupled with the name of Mr. Colin G. Patrick (President last year); "The President," and "The Visitors."

During the evening, the Secretary, Mr. H. J. Wheatley, announced donations to the amount of 335*l.* 11s.

Correspondence.

To the Editor of THE BUILDER.

THE SCENERY OF "BECKET."

SIR,—My attention has been directed to a short notice of my work for "Becket," which appeared in your Journal of April 1. To that portion of it referring to the last scene of the play—the scene of the martyrdom in the north-west transept of Canterbury Cathedral—you will, I feel assured, allow me to make the following reply.

You say, in the first place, that in "treating the scene, I have reverted unfortunately to the typical scene-painter's indifference to architectural fact," perhaps rather in this case architectural probabilities built upon facts. This remark, I can assure you, is most undeserved—instead of being indifferent, I have an intense love and veneration for architectural consistency and truth, and have never considered a departure from it and structural necessity condoned by pleading "Scenic effect." In this particular case I spent some weeks in the library and in the cathedral before I started upon the actual work. The scene is built upon the exact lines of the church of Lanfranc (that was in existence at the time of Becket), my authority for which is to be found in Stanley's "Memorials of Canterbury Cathedral," taken I think from Professor Willis's restoration, the proportions of the scene being almost the same as those of the actual transept. You say that I might have taken the north-east transept as my model. To this I must dissent, as with the exception of its north wall, it is in the Transition style, and was built by William of Sens some fifty years after the murder of Becket. The windows in the north-east transept referred to are the only circular-headed arches; all the others are pointed.

The eastern apsidal chapel I am told I "ought to have introduced," and that is just what I have done, in place of the "absurd aisle" with which I am credited, and which is just what I have not done. The details of the side chapel (the chapel of St. Benedict) I borrowed from the chapel of St. Anselm, doubtless a portion of the church of Ernulf and his successor Conrad, the cathedral of Becket's time. Now, with respect to the flat roof, of which you say that it is "just in the very place in which there would not be one," I can only meet this statement with a positive contradiction. It is in the only position where I could have placed it, and where it actually was, above it being the chapel of St. Blaise.

The monk Gervase, in his description of the Cathedral of Lanfranc, says, in fact, "In the choir of Ernulf the pier-arches and marble walls between were continued from the tower-pier to the Presbytery, thus cutting off the transepts, which, like the choir, had flat ceilings." The height of the said ceilings being still determinable by the set-off in the wall, by a portion of the string-course still remaining, and by indications of the door which admitted to the chapel of St. Blaise some 20 ft. above. The corresponding staircase and door in the south-west transept is still in existence. Lastly, with respect to the steps, I have only to say that I have placed them in the scene in the position in which they now are and were then, leaving out the tunnel which now runs under them, connecting the north with the south transept, and of comparatively recent construction; these steps lead, not to the dormitory, which is on the other side of the cloisters, but to the choir. In decorating the side of the main steps leading to the choir I have gone beyond fact but not outraged possibility. The little columns and arches I took from the arcading that runs under the windows of the choir aisle; the sort of trellis-work decoration of the front steps, up which Becket is forced by the Monks, is taken from the wall a little farther to the east in the passage leading to the crypt—early work, cut with the hatchet, representing bamboo. From whence came the idea?

One word upon the "servants' area railing to the front steps." I presume this description is given on account of its poverty-stricken appearance; but a plain iron hand-rail is plainly but an iron rail, useful if not ornamental. In what this most primitive arrangement differed in the eleventh century from an arrangement designed to meet a similar purpose in the nineteenth, I regret to say I am perfectly ignorant.

Many years ago, when Mr. Maddox was manager of the Princess's Theatre, Herr Formes, rehearsing for the "Barber of Seville," remarked upon seeing the first scene—"Mainz." "Seville" replied Maddox. "Mainz," repeated Formes positively. Maddox seeking moral support from his scene-painter whispered, "It is Seville, isn't it?" "Yes, sir," replied the naughty painter. "It is Seville," shouted the manager. "I know it, I lodged at the house on the right."

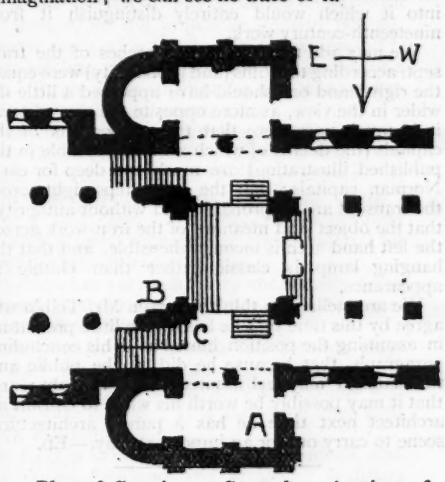
This anecdote, though happily in this case it does not represent the morality of either employer or employed, illustrates the dependent position of the employer. He should be able to say, "So-and-so is right because So-and-so is responsible for it, and I believe him to be an honest workman; and until he is proved otherwise I consider that in offering his work to the public I am not offering a fraudulent or adulterated article."

W. TELBIN.

*** In regard to the north-east transept, Mr. Telbin is practically right; we forgot at the moment that the interior had been re-faced by William of Sens, though the transept was *not* "built" by him, as Mr. Telbin says; the bulk of the walls is all Norman, Lanfranc's or immediately after him. For the rest, Mr. Telbin's letter shows that he made more conscientious efforts to understand the problem than we had credited him with, but unfortunately his want of architectural knowledge has rendered them futile. We will take his points *seriatim*.

1. Our remark about the flat ceiling was made under the supposition that Mr. Telbin had assumed the existence of an aisle in the transept, forming the foreground of his view; and our reason for thinking so was that if we were supposed to be looking south out of the transept the view must have been partially blocked by the great crossing piers, whereas we appear to look across into a large empty space.

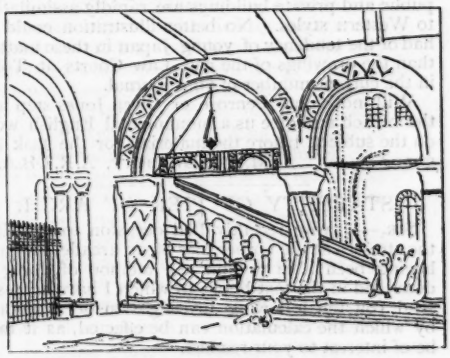
2. Mr. Telbin now explains that his foreground *is* the transept, and that he intended to follow the restoration of the cathedral plan in Becket's time, as given by Willis. Unfortunately he understands neither the plan nor the existing building, nor (as appears to us) the ancient records. He quotes Gervase as asserting that the transepts had flat roofs. Amid an unusually busy week we have not had time to get hold of Gervase's original Latin anywhere, but we may point out that Willis, who is a good authority on Latin as well as on architecture, translates Gervase's words as to the pillar in the transept "This pillar sustained a vault which proceeded from the walls on three of its [the transept's] sides"; that Willis always refers to it as vaulted, and that the fact that there was a chapel over the transept is exactly the reason why it *would* be vaulted, according to all the habits of Mediæval building, in order to make a monumental construction. Nothing could be more un-Gothic than Mr. Telbin's assumption of a flat wooden ceiling to the transept, forming the floor of a chapel over it. The "set-off in the wall" supposed to indicate the height of this ceiling must exist in Mr. Telbin's imagination; we can see no trace of it.



Plan of Crossing at Canterbury in time of Becket, as restored by Willis.

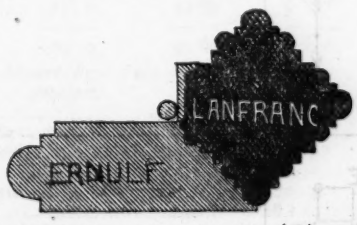
3. Mr. Telbin then goes on to assert that he has placed the steps in the scene "in the position in which they now are and were then, leaving out the tunnel which runs under them." This would be incomprehensible except for the reference to the tunnel, but it appears that Mr. Telbin has actually mistaken the end of the existing wide steps between the east and west crossing piers for the ancient steps shown at C in the accompanying tracing from Willis's plan. Those steps (C) no longer exist, but steps in a corresponding position on the south side of the choir exist, and if Mr. Telbin goes round and looks at them he will see what was really the position of the steps shown by Willis, which were not between the east and west crossing piers, but *built against* the eastern ones.

4. This mistake seems to have led Mr. Telbin to the more serious mistake in his scene, of omitting the great crossing piers near the foreground. The accompanying cut is a reduced outline of



Outline Sketch of Mr. Telbin's Scene, traced from the published illustration.

the main lines of his scene, traced from the published illustration. Comparing it with Willis's plan, it will be seen that from the lines of the perspective the point of sight must have been about opposite A on the plan. Every architect will see



Plan of North-east Crossing-pier (B), as given by Willis.

that in that case the north-east pier of the crossing, against which the steps were built, and of which Willis gives the accompanying restoration, must have

blocked up the whole view through the left-hand arch, and the south-east pier would have been partially seen through the right-hand arch. The north-east pier, coming close up to the steps at the foot of which the monk is standing, could only be adequately represented by a built-up piece, if the practicable portion of the stage goes back beyond those steps; at all events it must have been a prominent object obstructing the view, and there is not a trace of it. The fact is that Mr. Telbin has got the steps in the right place according to Willis's plan, but having mistaken them for other steps existing in the building, he has got completely at sea about his position, and has lost sight of the crossing piers altogether.

5. In regard to the "area-railing," Mr. Telbin's remark that a handrail is only an iron rail, whether in the eleventh or nineteenth century, only shows how little he understands the difference between the spirit of Mediæval and modern handicraft. No Mediæval craftsman, early or late, would have made an iron rail without putting something of character into it which would entirely distinguish it from nineteenth-century work.

We may add that as the two arches of the transept, according to Willis (and probability) were equal, the right hand one should have appeared a little the wider in the view, as more opposite the eye, whereas it is much narrower; that the proportions of the capitals (the details of which are not traceable in the published illustration) are much too deep for early Norman capitals; that the wide steps right across the transept are improbable and without authority; that the object and meaning of the iron-work across the left hand arch is incomprehensible, and that the hanging lamp is classic rather than Gothic in appearance.

We are inclined to think that even Mr. Telbin will agree by this time that he has been a little premature in assuming the position hinted at in his concluding paragraph, that because he did it, the public and the manager may feel assured that it is right; and that it may possibly be worth his while to consult an architect next time he has a purely architectural scene to carry out for an important play.—ED.

JAPANESE ARCHITECTURE.

SIR,—The notes on Japanese Architecture in the last two issues of the *Builder*, and the extremely interesting drawings with which they were accompanied, will, I hope, be a means of directing attention to this subject from the point of view of accurate record.

The extensive literary and pictorial illustration which Japanese work has lately received has been almost entirely of a merely picturesque character, and it is to be hoped that now an enthusiast may be found to combine ability with willingness to devote the necessary time and labour to the production of a permanent and tolerably complete series of drawings of some of the buildings of old Japan.

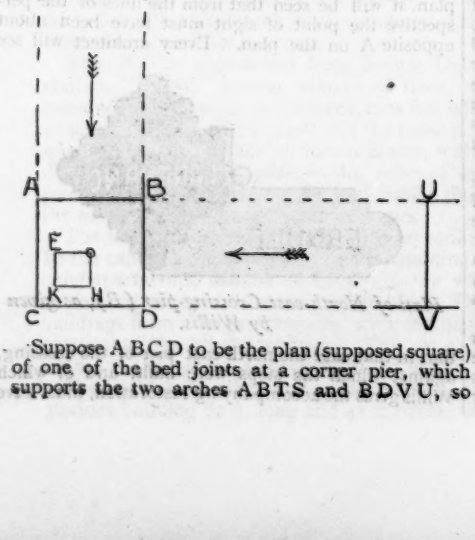
The castles of the feudal lords, which, before the revolution of 1868 were so prominent a feature, have nearly disappeared as complete buildings; the temples and shrines which so astonish the European by their marvellous colour and exquisite finish are falling to decay, never—now that the state of society which produced them is gone—to be replaced; and public and private buildings are rapidly assimilating to Western styles. No better illustration could be had of the tendency of young Japan in these matters than the drawings of the new Law Courts at Tokio in the current number of your journal.

Will not some Penrose or Owen Jones step into the breach and give us a monumental English work on the subject, before the materials for the task are gone?

MATT. GARBUTT, A.R.I.B.A.

STABILITY OF PIER OF ARCH.

SIR,—Having recently had occasion to calculate the stresses at the corner pier of an arcade, and not having been able to find the method of doing so described in the text-books to which I have access, I send you the following investigation of a method by which the calculation can be effected, as it may be of interest to your readers.



Suppose A B C D to be the plan (supposed square) of one of the bed joints at a corner pier, which supports the two arches A B T S and B D V U, so that the pier takes the two horizontal thrusts shown by the arrows. Under such circumstances the greatest pressure per square inch is at C, and the least at B; it is required to determine the pressures at C and B.

First, find the centre of pressure at the joint A B C D, neglecting the thrust of *one* of the arches, say A B S T. This may be done graphically, remembering that the load due to the arch A B S T has to be included as part of the vertical pressure on the joint. Let this point be E. Next, find the centre of pressure, neglecting the thrust of the other arch. Let this point be H. Dy drawing E K and H K parallel to A C and C D, we get K, the actual centre of pressure. Assuming that the shearing stress on the joint can be neglected, the resultant stress on the joint A B C D is equivalent to a single vertical force W, applied at K. If O is the centre of figure of the joint, the effect of this resultant force is equivalent to the following combination of forces:—(1) A force W applied at O; (2) A couple whose moment is $W \times OE$, tending to overturn the pier in the direction O E; and (3) a couple whose moment is $W \times O H$, tending to overturn the pier in the direction O H.

The stresses produced will be as follows, supposing the measurements to be taken in inches:—(1) a compression distributed over the joint of $\frac{W}{AB \times BD} = \frac{W}{AB^2}$ per square inch; (2) a compression along the edge A C, and a tension along the edge B D, each equal to $\frac{W \times OE}{\frac{1}{6} AC \times CD^2} = \frac{6W \times OE}{AB^3}$ per square inch; and (3) a compression along the edge C D, and a tension along the edge A B, each equal to $\frac{W \times OH}{\frac{1}{6} AB \times BD^2} = \frac{6W \times OH}{AB^3}$ per square inch.

Hence, we get a stress per square inch at C, of—

$$\frac{W}{AB^2} + \frac{6W \times OE}{AB^3} + \frac{6W \times OH}{AB^3}$$

and a stress at B of—

$$\frac{W}{AB^2} - \frac{6W \times OE}{AB^2} - \frac{6W \times OH}{AB^3}$$

If this last expression works out a negative quantity, it indicates that the corner B is not in *compression*, but in *tension*.

GAVIN J. BURNS, B.Sc.

CUNLIFFE *v.* HAMPTON WICK LOCAL BOARD.

SIR,—The condensed report of the above case and your "Note" thereon, in the *Builder* of April 8, do not clearly give the true facts of the matter;* and with your permission I will place them before your readers as briefly as possible.

The contract was for excavating and laying main sewers and branch drains for house connexions, the Local Board providing the stoneware pipes. The soil was of a wet, sandy, and treacherous nature, as stated. The pipes had simply to be laid in the ground without concrete or foundations of any kind. The branch drains for house connexions to be laid slanting to a regular gradient. Now what occurred was this. Vicarage-road sewer, of only 7 in. pipes, being 18 to 20 ft. deep, the Board thought they could save money by bringing up the branch drains *vertical* to about 6 ft. from the surface instead of slanting as originally intended. The Surveyor gave orders for the junction pipes to be turned *upwards*, and being oblique, or Y junctions, a bend to be put on to bring them into a vertical position for continuing upwards. To prevent the curved bend from coming out of joint by the pressure of filled up earth, a small quantity of concrete was ordered to be put *round the bend only*, thus leaving a space of about 12 in. underneath the concrete to the bottom of the trench to be filled in with the material that came out, which, being silty sand charged with water, there was nothing solid for the concrete to rest on, and this forming a shoulder for the earth above threw all the weight on to the junction pipe, with the result that it broke and let in the sand, causing a stoppage in the sewer.

There never was any concrete either specified or ordered to be put round the junctions, and this is where the mistake occurred. To have been of any service at all the concrete should have gone down to the bottom of the trench and underneath the junction. As one of the Board's expert witnesses said:—"It was like hanging concrete up in the air to put it in such a position." I warned them of the danger, but was obliged to carry out the orders given me, whether right or wrong, and the Board have never been able to prove otherwise but what I did carry out those orders. The fixing of these junctions and vertical pipes in this position was a departure from the contract, so that it cannot be said that I "did not fulfil the obligations into which I had entered."

For the whole twenty junctions, vertical pipes, and concrete in Vicarage-road, I was only paid 3*l.* 15*s.*; at the same time the Board effected a saving of nearly 40*l.* Thus I get all the responsibility and this costly litigation, and the Board pocket all the benefits. It has been a question of cheapness with them throughout.

* The report (as stated by us) was condensed from a report in the *Times*.—ED.

This case may not add any more to your legal knowledge, but it will at least serve as one more warning to contractors, not to sign "anything and everything that is put before them," or to go on with work that is weak and faulty in design, for as contracts are now interpreted they will most assuredly be held responsible if anything goes wrong.

W. CUNLIFFE.

"SHOULD BRICKLAYERS TILE?"

SIR,—The remarks which have lately appeared in the *Builder* under the above heading raise the question, Who may and who may not do "tiling?"

From a common sense point of view, to say nothing of its legal aspect, when taking into account the liberty of the subject, the answer is simple enough. In my opinion (and I am no dunce in the matter) the most fit and proper persons to do "tiling" are those who are capable of doing it to the satisfaction of the employer who requires it to be done and has to pay for doing it.

I maintain that no man or body of men, be they bricklayers or slaters, has a prescriptive right to claim the exclusive privilege of doing this or any other description of work in connexion with the building trade, and any interference with the liberty of the subject and freedom of contract in regard to this and kindred matters is in direct contradiction to the spirit of the law, and should be so treated.

Be that as it may, however, one thing is certain, bricklayers were the one and only recognised "tilers" in times when slated roofs were unknown, or before they came to be generally adopted.

Time was, even within my own recollection, when in many provincial localities,—tiling and plastering were of greater importance to bricklayers, and occupied a considerably larger share of their time than matters appertaining to actual bricklaying. In so far as relates to tiling, the same system prevailed in London until less than a score of years ago, when firms, hitherto considered to be slaters, pure and simple, took up with it, presumably, in the first instance, to recoup themselves for the proportionate loss of their slating business caused by the somewhat sudden revival of tiled roofs, coupled with the introduction about the same time of flat roofs covered with concrete and asphalte. Hence the origin of the titular distinction assumed by slaters—"slater and tiler."

It is doubtless quite correct to say there are numbers of bricklayers in London who do not understand tiling, simply from the fact of their having learnt their trade there, and the existence of such a great preponderance of slated over tiled roofs; consequently they have had no opportunity to acquire the knowledge. On the other hand, it is equally true that for every single slater who can justly lay claim to be called, or to call himself, a thorough capable tiler, there are to be found hundreds of bricklayers who, having originally acquired the art of tiling in the provinces, where tiled roofs are the rule, are equally or even more proficient at the class of work in question.

Again, in the case of a tiled roof, the tiles, for well-understood reasons, should be methodically bedded; or, more correctly speaking, a certain portion only of each tile should be so bedded in mortar, notwithstanding that in some parts of the country they used to be bedded, or rather laid, on moss, hay, or straw, a practice that cannot be sufficiently condemned. Well, whoever may be called upon to execute the work, it is necessary that he should be master of the use of a bricklayer's trowel, not only for the purpose of effectually laying the mortar, but also for cutting the tiles, as in the case of hips, valleys, vergings, &c., &c., and I never yet saw a slater, or even a mason or plasterer, who could successfully fulfil that essential condition. Those slaters whom I have had opportunities of seeing at this work simply bite off the portion of a tile that needed cutting with a pair of powerful pliers, something like a rat gnawing at a piece of wood.

Where the mischief—I had almost said the absurdity—of this controversy comes in, is when the bricklayers' trade union interfered and brought about a strike, thereby causing a large number of men, who might otherwise have been profitably employed, to be thrown on the streets, to swell the already overcrowded ranks of workmen of all branches seeking work.

Why, it is only the other day that several trade societies in connexion with the building business were moving heaven and earth to federate for mutual protection, as it was stated; yet here we have the sorry spectacle of two out of the so-called federation already tearing at each other's throats.

COMMON SENSE.

THE ENGLISH IRON TRADE.—In but few instances are there any signs of improvement in the English iron trade. Both prices and demand in the crude iron branch lack steadiness, although nominal quotations are adhered to in most cases; but in Lancashire rates are a trifle lower. Business in finished iron is restricted to hand-to-mouth requirements. Tinplates, however, continue to experience a better enquiry, although values are still stationary. Steel is only in limited request. The shipbuilding and engineering industries continue to manifest dulness. The coal trade is quiet.—*Iron*.

The Student's Column.

CHEMISTRY.—XVI.

Symbol Sr. *Strontium. Atomic Weight* 87.

STRONTIUM is a yellow metal somewhat harder than calcium. It rapidly oxidises when exposed to air. It is not found in an uncombined state in nature, but occurs as *celestine*, a sulphate of strontium, sometimes in crystals and sometimes in amorphous fibrous masses ($SrSO_4$). Strontium salts colour flames a magnificent crimson, and are for this purpose employed in the manufacture of fireworks.

Symbol Al. *Aluminium. Atomic Weight* 27.

Aluminium is now an important article of commerce. With the exception of silicon and oxygen it is the most abundant of the elements. It is not, however, found in the free state, and unfortunately all the methods at present known for separating it from its compounds are rather costly. It is found principally as *clays*, which are aluminium silicates. It also occurs in large quantities in the varieties of *felspar*, which are silicates of aluminium and potassium, sodium or calcium. Common felspar has the formula $KAlSi_3O_8$. As oxide (Al_2O_3) aluminium is found as *corundum*, and coloured with metallic oxides as *ruby*, *sapphire*, and *emery*.

Bauxite is hydrated aluminium oxide, Al_2O_3 $2H_2O$, containing more or less iron oxide.

Aluminium is a silver-white metal which is capable of assuming a bright polish. It is very malleable and can be drawn into fine wire or hammered into thin leaf. It is best worked at a temperature of 212 deg. F. to 300 deg. F. (Roscoe). The cast metal is as hard as silver and has a specific gravity of 2·56, while the rolled metal is about as hard as soft iron and has a specific gravity 2·67. *Pure* aluminium does not oxidise at ordinary temperatures in the air, but the ordinary commercial metal after a time becomes covered with a thin film of oxide.

The following are analyses of commercial aluminium:—

Process.	Aluminium.	Silicon.	Iron.	Analyst.	Date.
Deville-Castner..	99·20	0·50	0·30	Cullen	1889
Grabnau	99·62	0·23	0·15	Krant	About same date.

When aluminium was first made on a commercial scale it was very much more impure than the above samples.

Grabnau's Process for manufacturing aluminium consists in pouring artificially-prepared aluminium fluoride at a temperature of about 1,112° F. upon melted metallic sodium, the reaction which then occurs being expressed thus—

$$2Al_2F_6 + 3Na_2 = Al_2 + Al_2F_6 6NaF.$$

It is claimed that metallic aluminium can be obtained in a purer state by this process than by any other that can be worked on a commercial scale.

The *Deville-Castner* process is employed by the Aluminium Company, Limited, at their large works at Oldbury, near Birmingham. It consists essentially in the reduction of a purified double chloride of aluminium and sodium, $Al_2Cl_6 2NaCl$, by metallic sodium, the reduction being effected in reverberatory furnaces. The reaction which takes place is represented thus—

$$Al_2Cl_6 2NaCl + 3Na_2 = Al_2 + 8NaCl.$$

Aluminium is also produced both in America and England by the *Cowles Bros. Process*, "by reducing an aluminium compound in company with a metal in presence of carbon in a furnace heated by electricity; the alloy of aluminium and the metal formed being further treated to separate out the aluminium." (English Patent, 9,781, August 18, 1885.)

The aluminium compound employed is alumina, Al_2O_3. It is said that if the mixture in the electric furnace consists of carbon and alumina only, metallic aluminium is produced, but volatilises, part escaping into the air and burning to Al_2O_3, and part condensing in the upper layer of carbon (charcoal), forming crystalline masses of nearly pure aluminium, and yellow crystals, supposed to be a compound of carbon with aluminium. In collecting this divided metal a considerable quantity of it was lost, so that altogether the total yield of metallic aluminium was poor. If, however, metallic tin is previously added to the mixture, the aluminium produced all combines with the tin to form an alloy. This alloy is then fused with lead, when the tin leaves the aluminium and combines with the lead. The alloy of tin and lead being heavier than the aluminium, sinks below the aluminium. Aluminium manufactured by this process is liable to contain traces of lead. The chemical reduction of the alumina by the carbon may be expressed thus:—

$$3C + Al_2O_3 = 3CO + Al_2$$

Although aluminium may replace iron and steel for many purposes at some future period, it is not yet cheap enough to do so to any appreciable extent. It is at present mostly used in alloys. Both the English and American Cowles Company produce six standard grades of aluminium bronze as follows:—

"Special"	A containing	11	per cent aluminium.
	A ,,	10	,, ,,
	B ,,	7½	,, ,,
	C ,,	5-5½	,, ,,
	D ,,	2½	,, ,,
	E ,,	1¼	,, ,,

Unalloyed metallic aluminium is at present chiefly used where lightness is a great object, such as for military equipments, &c., because it is much lighted than any other common metal. According to W. H. Barlow, a bar of aluminium 3 ft. long and ¼ in. square, showed a large range of elasticity and gave results as indicated below:—

	Weight of 1 Cubic ft. in lbs.	Tensile Strength per sq. in. in lbs.	Length of a Bar able to Support its Weight in ft.
Aluminium	168	26,800	23,040
Steel	490	78,000	23,040
Wrought Iron.....	480	50,000	15,000
Cast Iron	444	16,500	5,351
Bronze	525	36,000	9,893

Aluminium may be distinguished from silver, zinc, tin, and all other white metals, except platinum by its being unacted upon by nitric acid. It may be distinguished from platinum by the fact that while platinum is unattacked by hydrochloric acid, aluminium is soluble in it. The present price of commercial aluminium is about 3s. per lb.

Alums.

With the exception of clays, the alums are the most important commercial salts of aluminium. In commerce the term *alum* is restricted to a class of double salts, containing sulphate of aluminium. They are extensively used as mordants in the processes of dyeing and calico-printing. The two most important alums are—

Potash alum .....$Al K(SO_4)_2 + 12H_2O$.

Ammonia alum.....$Al(NH_4)_2SO_4 + 12H_2O$.

Alum is found native in volcanic districts, and is also extracted from "alum shales," found in certain parts of England and Scotland.

Native alum, however, forms only a very small portion of the total quantity used in the United Kingdom. There are a great many different processes for manufacturing alum, much of that used in England being prepared from *alumite*, a native sulphate of aluminium. It is converted into potash alum by being mixed with potassium sulphate solution, and then crystallised by evaporation. The potassium sulphate is manufactured from cheap potassium chloride, imported from Stassfurt, in Germany, by treating it with sulphuric acid in a salt-cake furnace. Ammonia alum is no longer manufactured in this country, but can be obtained in a similar manner from alumite by treating it with ammoniacal gas liquor.

Sulphate of Aluminium, $Al_2(SO_4)_3$, is obtained by dissolving aluminium hydrate in dilute sulphuric acid, and evaporating the solution to dryness. On a large scale it is manufactured by roasting the purest china clay, and then heating it with sulphuric acid in leaden boilers. The clear solution of aluminium sulphate thus obtained is evaporated until it is found, by testing a small quantity, that it will solidify on cooling. It is then allowed to cool, and the mass is cut into blocks and sold in the market as "concentrated alum." It is largely employed as a substitute for ammonia and potash alums, for when fairly pure it is found that it can safely be used for ordinary dyeing and calico-printing.

Clays.

Marls are clays which contain much carbonate of lime. Clays are hydrated silicates of aluminium, and most frequently result from the decomposition of the felspar in granite produced by "weathering."

The behaviour of clays, when heated, depends greatly upon the amount of such impurities as lime, magnesia, and iron compounds they contain.

Iron Pyrites in clay should be removed, because when the clay is heated the pyrites will oxidise and split the clay into pieces.

Oxide of Iron in clay affects its colour. The tint of a clay before being burnt is no criterion of its subsequent appearance, which depends upon the amount of iron compound in the clay, and the temperature to which it is heated.

Carbonate of lime, when present in the form of small lumps, in clay is objectionable, because the carbonate when heated is converted into quicklime, and when the material is exposed to damp air, this is liable to slake, and, by expansion, to crack it.

The alkalies, potash and soda, should not be present in large quantities in clay for brick-making, because they act as a flux, and cause the bricks to melt and lose their shape.

Kaolin, *China Clay*, *Porcelain Clay*, or *Cornish Clay* is the purest variety of clay, and was formerly obtained from a mountain in China. It is produced by the decomposition of the felspar in granite. It is now obtained in large quantities from Cornwall and Devon, and is used for the manufacture of china and porcelain. It is produced principally by the decomposition through weathering of *pegmatile*—a variety of granite containing very little mica or quartz. It is a soft, friable white earth, and is freed from the quartz, mica, and undecomposed felspar it contains by washing it in a stream of water. The kaolin, being much lighter than the impurities, is carried along with the stream, while the impurities remain behind. The water containing the kaolin in suspension is run into settling tanks, where the clay settles as a cream. From these stone tanks it is removed to be artificially dried on porous tiles.

China Stone or *Porcelain Stone* is a variety of partially decomposed granite, which, unlike china clay, can be vitrified in the ordinary furnace. It is much used by porcelain manufacturers. *Potter's Clay* is a soft clay. It is infusible in ordinary kilns, and is used without any other material for the manufacture of tobacco-pipes.

Fire Clays are very refractory and usually occur underneath beds of coal. Hence they are sometimes termed "underclay."

Plastic Clay occurs beneath the London clay. It is used in the manufacture of *seggars*, the coarse earthenware cases in which china and porcelain ware is fired. It is also sometimes used for brick-making.

Slate Clay is found in Devon and Cornwall, and also in Wales, Scotland, and Ireland. It differs greatly in different districts. In one form it is found in very hard masses which can be cleaved into slabs or slates and employed for roofing, while in another form it occurs as the "killas" of the Cornish miner, which is soft and has an earthy fracture and crumbles to a powder when immersed in water for any length of time. When fairly pure, this latter variety is ground and made into a paste with water for making fire-bricks.

Common Clays are employed for manufacturing bricks, tiles, and coarse pottery. They vary greatly in composition and colour. They are very abundant, and often occur in immense deposits on the surface of the earth as "boulder clay" or "drift clay." *Blue bricks* are made from the red clays and marls containing much iron which are found in the Midland counties. *Light yellow* bricks are obtained from the common clays of the eastern and some of the east-Midland and southern counties. *Bright red* bricks are obtained from clays containing a considerable amount of oxide of iron. Artificially *white bricks* are obtained by adding powdered chalk to clay before burning, while magnesia in the presence of iron oxide will produce *yellow* bricks.

Before use, all clays should be heaped up and exposed to the weather for as long a period as possible. It is found that ware containing clay which has been exposed for a long period is less liable to shrinkage than when manufactured from clay that has not been properly weathered.

The following tables show the composition of various clays used for pottery wares, brick-making, &c., but it should be noted that the value of a clay frequently depends more upon its physical characteristics than upon its chemical composition.

China Clays (washed).

Analyst.	Ebelmen & Salvetat.	Richardson.	
Locality.	Chinese.	St. Yrieux.	Cornwall.
Silica	50·5	48·37	46·32
Alumina	33·7	34·95	39·74
Iron oxide.....	1·8	1·26	·27
Lime	—	—	·36
Magnesia	0·8	trace	·44
Potash and soda	1·9	2·40	12·67
Water	11·2	12·62	
	99·9	99·60	99·80

Stourbridge Fire Clay.

Analyst.	Tookey.
Silica.....	65·10
Alumina	22·20
Iron oxide	1·92
Lime.....	·14
Magnesia	·18
Potash	·18
Phosphoric acid.....	0·06
Organic matter	·58
Water (combined).....	7·10
,, (hygroscopic)	2·18

Clays used for Terra-Cotta and Tiles.

	Thames Mud (burnt dark red). Dr. Playfair.	Blue Barrow, Cornwall. Dr. Playfair.	Red London Clay.	Blue Clay, Wareham. Mr. Weston.	Red Clay, Wacombe. Dr. Percy.
Silica	44·15	45·52	50·40	48·99	57·83
Alumina ...	11·27	40·76	24·00	32·11	20·55
Iron	5·95	...	...	2·34	7·75
Lime	17·02	2·17	2·70	0·43	1·68
Magnesia..	2·25	traces	1·30	0·22	0·97
Carbonic acid	...	...	...	...	0·90
Phosphoric acid	...	...	...	...	traces
Potash... }	1·30	1·90	...	3·31	3·87
Soda ... }		...	...	...	0·56
Manganese	...	...	...	...	traces
Sulphate of lime...	4·53	...	...	...	...
Phosphate of lime...	0·72	...	...	...	...
Organic matter ...	9·15	....	...	...	4·39
Loss and water ...	3·66	9·61	21·60	11·96	2·13
	100·00	99·96	100·00	99·36	100·63

Brick Clays.

Authority.	Abney. Burham Clay.	Abney London Brick-clay.	Abney Loam.	Knapp. Marl.
Silica	42·92	49·5	66·7	} 43·0
Alumina	20·42	34·3	27·0	
Oxide of Iron	5·00	7·7	1·3	3·0
Carbonate of Lime.....	18·91	1·4	0·5	46·5
Carbonate of Magnesia	0·12	5·1	...	3·5
Potash and Soda	0·33	...	...	} 4·0
Water	6·68	...	...	
Organic matter	5·01	1·9	5·0	...
	99·39	99·9	100·5	100·0

OBITUARY.

MR. R. HERBERT CARPENTER, F.S.A., F.R.I.B.A.—We have to record, with great regret, that Mr. Richard Herbert Carpenter, F.S.A., F.R.I.B.A., died quite unexpectedly at his residence, Leinster-square, on Tuesday night. He had been unwell for some little time, but his death was the last thing that his friends expected or feared. Mr. Carpenter, who was in his 52nd year, was elected an Associate of the Institute in 1863, and a Fellow in 1875. He died a Member of the Council. The interment will take place this Saturday afternoon (April 22), preceded by a funeral service at St. Stephen's, Bayswater, at 2.30.

GENERAL BUILDING NEWS.

PROPOSED NEW THEATRE FOR SHEFFIELD.—According to the *Sheffield Daily Telegraph*, a new theatre is shortly to be erected in Tudor-street, Sheffield. Protracted negotiations with the Corporation having come to a conclusion, the Council have accepted the plans prepared by Mr. Walter Emden, architect, London, in conjunction with Mr. Edward Holmes, of Sheffield. The building is to be of a domestic design, of red-pressed brick, with stone dressings, a cupola turret at the corner of Tudor-street and Arundel-street being the special feature. At this corner a portion of the building not needed for the theatre will be used for shops. There will be a pit, circle, and gallery. The stage will be 34 ft. deep, 72 ft. wide, the proscenium being 32 ft. wide and 30 ft. high. It is cut off from the auditorium by a fire-proof curtain. The entrance to the dress circle, which is to accommodate 350 persons seated and 200 more standing, will be from Tudor-street, and it is to be reached by two flights of stairs of 30 steps. The entrance hall is 14 ft. square, and the main corridor upstairs is 14 ft. wide. Coffee and smoke rooms are provided. The entrance to the pit, which is to accommodate 700 persons seated and 250 more standing, is also to be from Tudor-street, and it will be level with the road. Here, again, coffee and smoke rooms are to be provided. The gallery will be entered by a staircase of 42 steps, 8 ft. 6 in. wide, from Arundel-street, and for this portion of the building coffee and smoke rooms are also provided. There will be seating accommodation here for 800 persons, and standing room for 200 more. All the entrances, passages, and corridors, lobbies and staircases, are to be made fire-proof, and the doors in every instance open in both directions, and it is calculated that the building could be emptied of its 2,500 people easily in five minutes. Several extra exits are arranged for. The ventilation throughout is by means of exhaust fans, in some cases fixed in the walls, and in others in the roofs, with chimneys and cowls.

CHURCH, HAZELBURY BRYAN.—The chancel of the church at Hazelbury Bryan, Dorsetshire, has recently been restored and decorated. The oak choir-stalls were made by Messrs. Merrick & Son, of Glastonbury. The tile work was entrusted to Messrs. Carter, of Poole. A portion of the design is from an old tile found in the church, and evidently one of the original ones used when the church was built, about A.D. 1397. The new tiles have been accurately reproduced by Messrs. Carter. The reredos consists of three large centre panels of alabaster and Devonshire marbles, with supporting columns of green Connemara marbles, with the caps, amulets, and bases of red and dark Devonshire marble. This part of the work was carried out by Mr. Barnes, of Portland. The four side panels are of large size and are of terra-cotta, manufactured by Messrs. Carter, of Poole. The designs on them are various emblems of the Passion. The painting is in Carter's "Tile Fresco," the work being carried out on the unburnt clay with different coloured clays, and the whole then burnt in so that the surface of the panels gives no glittering reflection, though it is just sufficiently vitreous to allow of its being washed, and even scrubbed, without injury. The elaborate stone-work was carried out by the Bath Stone Firms in Corsham Down stone, and came from their works ready for fixing. The work was carried out from the designs of the Rev. Canon Wheeler, the rector.

REFORM CLUB, WIGAN.—On the 12th inst. the foundation-stone of the new Reform Club at Wigan was laid by Mrs. Woods. The design comprises in the basement a restaurant, smoke-room, bar, kitchen, &c. The ground floor contains a large shop and show-room, and the first floor contains the club premises, consisting of a dining-room 36 ft. by 20 ft., with a movable partition between the reading-room, a billiard-room for two tables, a large front smoke-room, a committee-room or private room, and a bar, which forms the approach to the balcony over the front entrance. The second floor contains a billiard-room, a smoke-room, a bar, and the caretaker's living rooms, &c. The rooms for the club are arranged so as to be easily accessible from the central staircase and landings. Provision is made in the basement for hot-water apparatus, and the rooms are intended to be ventilated by special air flues built with the chimney-breasts; also the large billiard-room by roof ventilators. The front is to be built of pressed brick, with stone dressings. The architects are Messrs. Heaton & Ralph.

WESLEYAN CHAPEL AND MISSION HALL, LEEDS.—A new Wesleyan Chapel is about to be erected in Roundhay-road, and a new mission-room in Roseville-road, Leeds. Fronting to Roundhay-road, the building will be in the Classic style, with a main entrance in the centre and two side entrances for the gallery. There will also be a means of access from the adjoining building. The structure, which is to be of pressed bricks, with stone tracery, will be 94 ft. long by 60 ft. wide, and with seating accommodation for about 900. At the entrance there is to be a large vestibule, 31 ft. long by 8 ft. wide. The chancel will be separated from the rest of the chapel by a moulded arch, supported on granite columns. A minister's vestry and two or three other rooms are also shown on the plans. The total cost will be about 5,000*l.* The new mission-hall in Roseville-road is to take the place of a small room in Enfield-road. The new building will cost about 2,300*l.* The plans, both for the chapel and mission-hall, have been prepared by Mr. G. F. Danby, architect, Leeds.

FOREIGN AND COLONIAL.

BERLIN.—After the unsuccessful attempt to blow up the old "Dom" with some 108 kg. of dynamite, a second attempt was made with 150 kg. of the same explosive. This charge also proved to be insufficient to bring about the total destruction desired, but the foundations of the cathedral were so weakened by the vibrations that they suddenly gave way some hours after.——Professor Otto, the great sculptor, who died last week, was buried with much ceremony, the Government and the learned and art societies being represented. There will be an exhibition of Professor Otto's work in connexion with the coming International Art Show.——It has now been practically decided that the old Schlossplatz and the historical "König Strasse" are to be remodelled at the joint expense of the Emperor, the Government, and the City. The tramway company will be permitted to run its lines over the Schlossplatz to the Town Hall, as the Emperor will not oppose any of the necessary improvements of this kind.

HARBOUR AT BENGAZI.—According to a recent report of the British Consul at Bengazi, Tripoli, the construction of the jetty is being proceeded with, and one of the two arms is in a fair way towards completion. The construction of the other arm will be postponed until the completion of the first, and until the utility and force of resistance of the more exposed portion has been properly tested. To transport the huge blocks of stone required for the further end of the breakwater, a railway, 3⅜ miles long, has been constructed from the quarries of Twyhad to the landing stage and thence on to the jetty's end. The rails were obtained from Messrs. Cockerill Brothers, of Seraing, and the locomotives from France. The cost of the line, including its appurtenances and the labour employed, was 8,600*l.*

MISCELLANEOUS.

BURTON-UPON-TRENT MAIN ROAD ARBITRATION.—The award of the Local Government Board in the Arbitration held before Mr. Coddrington in November last, as to the amount to be paid by the Staffordshire County Council to the Burton Town Council for the maintenance of the main roads within that Borough for the year 1890-91, has just been made. The dispute arose in consequence of the County Council refusing to pay the amount of the claim made by the Borough. The original claim made by the Town Council was for the sum of 2,361*l.* 16s. 11d. Of this amount the County Council paid only 1,569*l.* 11s. 1d. Subsequent negotiations ensued between the authorities, and eventually the County Council agreed to increase the amount of their contribution, but as the amount even then was not considered reasonable, the Town Council, on the advice of their Borough Engineer, Mr. J. E. Swindlehurst, C.E., decided to appeal to the Local Government Board. The award now made is, that the County Council shall pay the sum of 2,334*l.* 19s. 6d., or 26*l.* 17s. 5d. only less than the original claim of the Town Council, the amount of the award being much greater than the Corporation had at one time offered to accept with a view to settle the matter.

GROUND-RENT AT CROYDON.—We are informed that at the Auction Mart, on Thursday, April 13, Messrs. Ball, Norris, & Hadley sold a ground-rent of 362*l.* 10s. a year, secured upon the premises in the occupation of the London and County Banking Company, Limited, in High-street, Croydon, for 11,500*l.*, being nearly thirty-two years' purchase.

ROYAL STATISTICAL SOCIETY.—At the meeting of the Royal Statistical Society on Tuesday last, a paper was read by Mr. Augustus Sauerbeck "On Prices of Commodities during the last seven years." The author, in examining the course of prices of commodities, found that in comparison with the average of the eleven years 1867-77 prices in 1887 had fallen 32 per cent.; from 1888-91 they were somewhat higher, declining again in 1892 to the same level as in 1887. A table of movements of prices from quarter to quarter was illustrated by diagrams showing the relative fluctuations of various groups of commodities, and a condensed review of the principal events during the last seven years gave an account of the trade activity from the end of 1887 to the middle of 1890, of the over-speculation, company promotion, &c., the crisis, the natural reaction from a period of prosperity, and of the extensive fall, particularly of corn, textiles, and minerals, but also of other commodities, during the last few years. With regard to the immediate future, a similarity is shown between the movements of prices from 1890-92 and from 1883-85. The improvement then commenced at the end of 1887, and at the present time, as in 1885-86, the production of commodities appears to be stationary. Although there are no signs as yet of any real improvement, and though some years may still elapse before a considerable development takes place, the author thought that with production arrested, a more healthy tone may set in, and that some improvement in certain branches may perhaps not be very distant.

ROYAL SCOTTISH SOCIETY OF ARTS.—The tenth meeting for the season of the Royal Scottish Society of Arts was held in the hall of the Society, 117, George-street, Edinburgh, on Monday last, Mr. Charles A. Stevenson, B.Sc., M.Inst.C.E., in the chair. The second part of a paper on the utilisation of water for power was read by Mr. John Ritchie. The lecturer described the most modern appliances for obtaining power from water, and the theory of their action. He showed the difference between pressure and impulse turbines, and the particular application of each to varying falls of water; and an improved means of regulating the flow of water into turbines invented by the lecturer was illustrated by diagrams and models. A description was also given of several applications of water power for electric lighting purposes carried out by Mr. Ritchie, with exceptionally high falls, one having a head of water of 650 ft., and giving off 35 horse-power, the whole of the water being conveyed through a 6-in. rivetted steel pipe. An interesting discussion followed, and in reply Mr. Ritchie stated that the public were waking up to the fact that an enormous waste was taking place—a waste that was capable of being utilised to the benefit of the landowner and the manufacturer. It was also stated that several towns were contemplating the introduction of the electric light, the water entering the reservoirs under considerable pressure to supply the motive power, and that that arrangement had been at work in Greenock for some years.

MAINTENANCE OF MAIN ROADS IN CORNWALL.—The want of a proper system of control for the

main roads of the County of Cornwall has frequently been commented on at the meetings of the County Council. The scheme introduced in the West Penwith Division has been pointed to on many occasions to prove the contention that economy in maintenance follows direct responsible control. Before the introduction of the present scheme 20¼ miles of road and four bridges used to cost an annual sum of 1,902*l.* Last year the expenditure on the same mileage amounted to 1,343*l.*, from which some 277*l.* has to be deducted for value of stone in stock, cost of improvements, water and mud carts, &c., showing the total net cost for the past year to have been only 1,065*l.* A saving of 836*l.* has thus been effected in the working of the new scheme, and last year it was reported that the saving was 700*l.* If such an annual saving can be claimed in the management of twenty miles of main roads, what great saving of the rates may not be effected in the cost of maintenance of the whole of the main roads of the county? The introduction of a much more costly material than was ever before used, the expense of watering the roads, and other additional improvements, have only resulted in the present scheme of reducing the cost of maintenance, and the system under which the West Penwith roads are managed seems worthy of the close attention of the Council.—*Western Morning News.*

THE NINETEENTH CENTURY ART SOCIETY has fixed Tuesday, May 2, for the reception of works intended for the Summer Exhibition (the Thirtieth) of the Society, at the Conduit-street Galleries.

ARCHITECTURAL ASSOCIATION: DISCUSSION SECTION.—The eleventh meeting of the session was held at the rooms of the Association on Wednesday evening, the 19th inst. Mr. A. W. Cooksey, A.R.I.B.A., read a paper on "Polytechnic Institutes." Assuming that no justification for their existence was necessary, he chiefly confined himself to the consideration of their management, their finance, and their threefold aim of technical education, physical education, and social recreation. The discussion which followed obtained special value from the presence of Mr. E. W. Mountford, who kindly gave the Section the benefit of his special experience. At the next (the last meeting of the session) a paper will be read by Mr. E. W. Wimperis on "English Gardens."

CAPITAL AND LABOUR.

STRIKE OF MASONS AT OKEHAMPTON.—According to the *Western Morning News*, about a fortnight ago the carpenters of Okehampton decided to ask the employers for more wages, and if not satisfactorily met to stop work. Their grievances were laid before the employers, and it was arranged that instead of being paid by the week at the rate of 1*l.* per week, they are to be paid by the hour at the rate of 4¾d. On account of the carpenters' success, all the masons have knocked off work in accordance with a resolution passed by them at a meeting a few days ago, agreeing to do so, unless they were paid 5d. per hour. The masons' employers do not look upon their grievances very favourably, and the men are likely (unless they start work again) to be out some time.

THE BUILDING TRADE DISPUTE AT NEWPORT.—According to the *Western Mail*, the local dispute between the men in the building trade and the masters is practically at an end. The bricklayers and wallers have come to terms with their masters, with some slight modification of the conditions of labour. The carpenters have agreed to settle their affairs on the old terms, so that now only the free-stone masons have a difference with the employers, and it is possible that this will result in a strike.

MEETINGS.

SATURDAY, APRIL 22.

Crystal Palace School of Practical Engineering.—Award of Certificates. 1 p.m.

Edinburgh Architectural Association.—Visits to (1) Leuchars Church; (2) Earlshall.

MONDAY, APRIL 24.

Surveyors' Institution.—(1) Adjourned discussion on Mr. T. Bright's paper on "Underwoods: their Growth and Utilisation"; (2) Mr. R. F. Grantham on "Recent Experience in Sewage Filtration Considered in Relation to River Pollution." 8 p.m.

Society of Arts (Cantor Lectures).—Mr. Lewis F. Day on "Some Masters of Ornament."—III. 8 p.m.

Society of Antiquaries.—Anniversary meeting. 2 p.m.

Leeds and Yorkshire Architectural Society.—Annual Report and Election of Officers. 7.30 p.m.

TUESDAY, APRIL 25.

Institution of Civil Engineers.—Further Discussion on the late Mr. P. W. Willans's paper on "Steam-Engine Trials." 8 p.m.

WEDNESDAY, APRIL 26.

Society of Arts.—Mr. H. Van der Weyde on "The Optical Correction of Photographic Perspective." 8 p.m.

Society of Biblical Archæology.—4.30 p.m.

Liverpool Engineering Society.—Mr. J. A. Saner on "Some English Canals and Rivers." 8 p.m.

THURSDAY, APRIL 27.

Institution of Electrical Engineers.—Resumed discussion on Mr. Albion T. Snell's paper on "The Distribution of Power by Alternate Current Motors." 8 p.m.

Society for the Encouragement of the Fine Arts.—Second Conversazione.

Society of Arts (Indian Section).—Sir Juland Danvers on "Indian Manufactures: their Present State and Prospects." 4.30 p.m.

FRIDAY, APRIL 28.

Architectural Association.—Mr. P. Gordon Smith on "Hygiene in its Application to the Arrangement of Buildings." 7.30 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. H. W. Handcock on "Fire-Risks of Electric Lighting." 7.30 p.m.

SATURDAY, APRIL 29.

Architectural Association.—Visit to the additions to the *Morning Post* premises, Wellington-street, Strand, by permission of the architect, Mr. H. O. Cresswell. 3 p.m.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

20,631.—FIRE-PLACES: *W. T. Mitchell.*—This patent comprises certain improvements in fire-places, which, whilst being simple and inexpensive to make, provide for a slow or a quick combustion of the fuel, and also insure a better draught than is usually the case. The fire-place framing is made of any suitable and ornamental design, and is provided with a canopy plate and a damper, which together close the opening between the fire-place and the flue. The canopy-plate is connected to the framing, and can be adjusted so as to vary the amount of draught, and also so as to automatically close the damper, which is hinged to the back part of the fire-place. Dished or curved fire-bars are fixed in the bottom of the grate, and a fire-brick slab, which is easily removable, is fitted upon, and covers their inner parts. When slow combustion of the fuel is wanted, the fire-brick slab is kept in the grate, but when quick combustion is desired it is removed.

3,686.—BRICKS: *J. Lodge.*—This specification relates to improvements in the construction of brick kilns for saving of coals and labour in burning the bricks. A top and bottom row of flues are inserted in the kiln, each flue having a separate chimney and damper, the flues being partitioned off inside the kiln to prevent one flue checking the draught from any of the others. By inserting these two rows of flues the fires are burning two ways in the kiln at one time, the steam is got out much quicker from the bricks, and they get more regularly burnt. If the fire acts more in one part of the kiln than another, the damper can be shut and check that part and taken to the part that has not sufficient fire. The fires can be taken to any one part of the kiln by having these two rows of flues and dampers, the dampers of all but one could be shut off and the fires all taken into that flue, and no fire would pass through among the bricks leading to these flues that are shut off if it was required.

4,062.—VENTILATORS: *C. F. and C. Kite.*—According to this invention, the valve-plate is mounted on a rod pivotted inside the valve-box, and operated by a hinge-jointed lever working in a slotted cross bar fixed in such box. A frame is fitted round the interior of the valve-box against which the valve-plate when closed fits. The jointed lever works up and down in a slot formed in the face-plate of the valve-box, and sufficient downward play is allowed to such lever to extend the hinge-joint, whereby the valve-plate is pressed against the frame and there tightly held until released by the upward movement of the lever, which operates the hinge-joint and thus opens the valve-plate.

5,210.—WINDOW-SASHES: *G. Ingram.*—This invention relates to improvements in window-sash holders for railway carriages and other vehicles. Horizontally across the top of the window-sash frame is placed a metal rod, having a double cam and a central pivot at each end, and a knob, or finger piece, at the middle. To each side of this frame is fastened vertically a flat spring, one end of each spring being turned over so as to form a round hole for the above-mentioned pivots to enter and partly rotate in. To each side of the sash-frame is screwed a small metal plate, as a fulcrum behind each cam, and adjacent to these plates are screwed, not quite home, plates made angular, so as to jut over the wood, or wood strips, forming guides for the window-sash on each side of the door. The springs press against the angular plates, whose grip on the wood strips holds the window in position. Either upward or downward pressure applied to the knob or finger-piece takes the pressure of the springs off the angle-plates, the pressure being resumed after the window is raised or lowered to the desired position.

5,726.—NAILS: *H. J. C. Keymer.*—This patent relates to the manufacture of nails, and has for its object to save much material now used by making the nail shorter, although holding more firmly. The point of the nail is, at the termination of the shank or body, split or made with fangs or projections, all being united at the nail point, but expanding outwards in the direction of the head of the nail. These nails are said to hold in practice more tenaciously than others one-third longer in size.

NEW APPLICATIONS FOR LETTERS PATENT.

APRIL 1.—6,791, P. Willis, Dog for Saw-mills.—6,794, W. Wagstaffe, Chimney-pots and Ventilators.—6,807, T. Limond, Furniture Rack Pulleys and Sash-fasteners.—6,829, J. Jefferson, Wood Pavements.—6,846, J. Neil, Door Sneck and Lock.—6,867, C. Martins, Automatic Disinfecting Apparatus for Water-closets.

APRIL 4.—6,887, J. Fallas, Picture-frame Moulding.

APRIL 5.—6,979, C. Firth, Machines for Sawing or Cutting Stone.—6,982, T. Twyford, Water-closets.—6,983, T. Twyford, Baths.—6,997, R. Scharf, Gauge to be used when Building Chimneys.—7,042, J. Craven, Brick-moulding Machines.—7,045, E. Wethered, Lock Furniture.—7,053, A. Gwatkin, Production of Designs on Paper, chiefly applicable to the Manufacture of Wall-paper.—7,056, T. Aldridge, Tiles.

APRIL 6.—7,076, J. Honeyman, Ventilators.—7,078, G. Redfern, Ventilators.—7,090, J. Thomlinson, Fireproof Floors and Ceilings.—7,095, B. & A. Dicksee, Flushing of Water-closets.

APRIL 7.—7,148, C. Hepworth and R. Robson, Domestic Fire-grates, &c.—7,155, D. Keith, Window-sash Frames.—7,206, J. Ludwig, Self-acting Door-closer.—7,211, G. Gin, Manufacture of Cement.

APRIL 8.—7,226, C. Showell and J. Lilly, Opening, Closing, and Securing Casements.—7,229, J. Frampton, Valveless Syphon Water-waste Preventers or Flushing Tanks.—7,234, R. Norris, Brick-moulding Machinery.—7,238, J. Glendenning, Fanlight Openers.—7,241, J. Horton and others, Chisels for Morticing, &c.—7,261, F. Holzer, Construction of Ceilings and Floors.—7,276, H. Lake, Bath Fittings.

PROVISIONAL SPECIFICATIONS ACCEPTED.

2,858, C. Penney and J. Thackrah, Water-closets.—2,965, J. Rossiter, Grooved Brick.—3,770, J. Williams, Cavity Building Bricks.—4,737, L. Nathan, Artificial Marble.—5,108, C. Elliott, Metallic Roofing.—5,250, A. Gibbs, Bricks—5,281, T. Paxton, Attaching Door Knobs, &c., to their Spindles.—5,306, Z. Baugh, Bakehouse Ovens.—5,308, C. Jones, Wood Screws.—5,519, F. Schweitzer, Connecting or Fastening together Stones and Plates for the Construction of Walls, or Ceilings.—5,520, F. Schweitzer, Plaster Boards or Slabs for the Construction of Ceilings, Walls, and Partitions.—5,871, W. Osmerit, Cutting the Pocket Pieces out of the Pulley Stiles of Sash-frames.—5,914, J. Shaw, Sash-Weights.—6,060, J. Wallace, Saw Blades and in Apparatus therefor, and for Sharpening Saw Blades.—6,097, J. Shanks, Water Supply and Discharge, Apparatus applicable to Water-closet or other Cisterns.—6,310, A. Bridgman and D. House, Saw Benches and other Sawing Machines.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

8,021, J. Bray, Extension Ladders.—8,346, W. Hewitt and A. Suart, Brick-making Machinery.—8,985, Yates, Haywood, & Co. and the Rotherham Foundry Co., Lim., Adjustable Fire-grates.—9,847, W. John, Facing Brick or Tiles, &c.—10,705, F. Underhay, Supplying Water to Water-closets.—14,336, J. Keseling and C. Fuchs, jun., Artificial Stone Composition.—16,354, J. Keseling and C. Fuchs, jun., Artificial Stone Composition.—3,272, G. Gibson Sash Locks for Windows.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

APRIL 6.—By *Fuller, Moon, & Fuller* (At Croydon): 16, 18, and 20, Kelly-rd., Croydon, u.t. 67 yrs., g.r. 18*l.*, 70*l.*

APRIL 10.—By *Walker & Runtz:* 24, St. Kilda-rd., Stoke Newington, u.t. 86 yrs., g.r. 11*l.* 11s., r. 60*l.*, 710*l.*—By *Holcombe & Betts:* 23, Walford-rd., Stoke Newington, u.t. 72 yrs., g.r. 6*l.* 10s., 430*l.*—By *Harman Bros.:* 11 and 12, Pope's-rd., Brixton, u.t. 76 yrs., g.r. 10*l.*, 460*l.*; 52, Down's Pk.-rd., Dalston, u.t. 70 yrs., g.r. 10*l.*, r. 42*l.*, 400*l.*; 82 and 84, Mina-rd., Old Kent-rd., u.t. 28 yrs., g.r. 7*l.*, 355*l.*; 16, Culmore-rd., u.t. 53 yrs., g.r. 5*l.*, r. 30*l.*, 250*l.*; 15, Clifton-rd., u.t. 53 yrs., g.r. 5*l.*, r. 26*l.*, 210*l.*; 86, Upland-rd., East Dulwich, f., r. 40*l.*, 655*l.*—By *B. Brown:* 29, Stork-rd., Stratford, u.t. 88 yrs., g.r. 5*l.* 5s., 130*l.*; 89, 91, and 103, Gilmore-rd., Lewisham, u.t. 86 yrs., g.r. 15*l.*, 480*l.*; 7 to 17 (odd), Milton-rd., Sittingbourne, u.t. 72 yrs., g.r. 15*l.*, 380*l.*; 5 and 6, Clifton Villas, Sudbury, u.t. 86 yrs., g.r. 10*l.*, 200*l.*; 29, Tower-rd., Bournemouth, u.t. 84 yrs., g.r. 4*l.*, r. 25*l.*, 200*l.*; 61 to 71 (odd), Tanfield-rd., Croydon, u.t. 87 yrs., g.r. 36*l.* 56*l.*; a profit rental of 10*l.*, u.t. 19 yrs., on 327, Cambridge-rd., Bethnal Green, 10*l.*—By *W. A. Blakemore:* 2 and 3, George-st., Holloway, f., 300*l.*; 4, Finsbury Market, Finsbury-sq., u.t. 27 yrs., g.r. 5*l.* 12s., r. 60*l.*, 430*l.*; 13, Cornwall-st., Pimlico, sold before auction.—By *G. A. Wilkinson & Son:* 155, Leadenhall-st., City of London, f., r. 500*l.*, area, 755 ft., 12,300*l.*; "The Swan and Horseshoe" public-house, Little Britain, f., r. 100*l.*, 2,800*l.*; 3, Bennett-st., Piccadilly, f., r. 165*l.*, 3,625*l.*; 1, The Glen, Forest Hill, u.t. 67 yrs., g.r. 12*l.*, 330*l.*; 25, 27, and 29, Moss-st., Bethnal Green, f., 740*l.*; the f. residence "Redspire," Dymchurch, Kent, and 12 a. 0 r. 22 p., r. 60*l.*, 510*l.*

APRIL 11.—By *C. W. Davies:* 33, Globe-rd., Mile End, f., r. 26*l.*, 290*l.*; 1, Willow-st., f., 170*l.*—By *Whittingham & Sons:* "Stanley House," Cambridge-rd., Lee, u.t. 70 yrs., g.r. 5*l.*, 1,100*l.*—By *Driver & Co.:* No. 64, New Bond-st., Corporation Lease, r. 550*l.*, 12,000*l.*—By *C. & H. White:* No. 125, Lambeth Walk, u.t. 16 yrs., g.r. 4*l.* 4s., r. 45*l.*, 220*l.*; No. 25, Camberwell New-rd., u.t. 7 yrs., g.r. 13*l.*, 80*l.*; 43, Auckland-st., Vauxhall, u.t. 1 yrs., g.r. 6*l.* 10s., 330*l.*; 2 to 14 (even), Kingston-st., Walworth, u.t. 76 yrs., g.r. 35*l.*, 1,475*l.*; 16, Glyn-st., Kennington, u.t. 73 yrs., g.r. 6*l.*, 350*l.*—By *Dunn & Soman:* Ground Area 1,200 ft., Basinghall-st., City, Let at 280*l.* per annum; Ground Area, 1,190 ft., Basinghall-av., Let at 170*l.* per annum.—By *Debenham, Tewson, & Co:* The Goodwill, Plant, Patent and Machinery, of "Shepherd's Corn Malting Co.," Hammersmith, including Five Cottages, c. and l., 13,100*l.*; F.g.r. of 5*l.* 10s., Landcroft-rd, Dulwich, reversion in 86 yrs., 145*l.*; f.g.r. of 6*l.* 10s., ditto in 86 yrs., 160*l.*; f.g.r. of 12*l.*, Goodrich-rd., ditto in 86 yrs. 300*l.*; f.g.r. of 14*l.*, Crystal Palace-rd., ditto in 85 yrs., 350*l.*—By *Thurgood & Martin:* 78, Weedington-rd., Kentish Town, u.t. 60 yrs., g.r. 8*l.*, r. 45*l.*, 360*l.*; 31, Weedington-rd., u.t. 47 yrs., g.r. 5*l.*, r. 36*l.*, 320*l.*; 95 to 101 (odd), Mansfield-rd., Haverstock Hill, u.t. 58 yrs., g.r. 11*l.*, r. 116*l.*, 1,120*l.*—By *Rogers, Chapman, & Thomas:* A Plot of f. Land, Hetley-rd., Shepherd's Bush, 475*l.*; f.g.r. of 20*l.*, Redcliffe-rd., Brompton, Reversion in 68 yrs., 540*l.*; f.g.r. of 15*l.*, Ifield-rd., ditto in 73 yrs., 375*l.*

APRIL 12.—By *Beard & Son:* 25, Colville-ter., Bayswater, u.t. 68 yrs., g.r. 16*l.*, r. 70*l.*, 545*l.*; 41, Great Castle-st., Regent-st., u.t. 13 yrs., g.r. 24*l.*, r. 80*l.*, 440*l.*—By *Mansell & Rowe:* 67 to 73 (odd), Church-rd., Norwood, u.t. 50 yrs., g.r. 12*l.*, 1,000*l.*—By *J. and R. Kemp & Co.:* "West Villa," Catford, f., 455*l.*—By *F. Jolly & Co.:* 47 and 49, Kenilworth-rd., Brondesbury; 39 and 41, Agamemnon-rd., Hampstead; 7, 20, and 23, Ulysses-rd.; 43 and 45, Narcissus-rd.; 29, Cotleigh-rd.; and 34 and 35, St. George's-sq., Regent's-pk., sold before the Auction.—By *J. Nicholson & Son:* 113, New-rd., Bermondsey, f., r. 100*l.*, 1,800*l.*—By *W. Bradly:* The f. house, "Hope Villa," Hampton, r. 60*l.*, 770*l.*

APRIL 13.—By *G. F. Francis:* 8, Trevor-sq., Knightsbridge, u.t. 24 yrs., g.r. 9*l.*, r. 50*l.*, 345*l.*—By *C. C. & T. Moore:* 10 to 16 (even), White-st., Bethnal Green, u.t. 32 yrs., g.r. 7*l.* 5s. 9d., 1,000*l.*; 1, Nye-st., Poplar, f., 240*l.*; 20, Burdett-rd., Mile End, u.t. 55 yrs., g.r. 6*l.*, r. 34*l.*, 350*l.*; 108 and 110, Albion-rd., Walthamstow, u.t. 86 yrs., g.r. 9*l.*, 300*l.*; a plot of f. land, Ropemaker's-fields, Limehouse, area 2,967 ft., 600*l.*—By *Deeks, Stevens, & Hellis:* 11 to 21 (odd), Priory Mews, Wandsworth, u.t. 4 yrs., g.r. 10*l.*, 45*l.*—By *Ball, Norris, & Hadley:* F.g.r. of 362*l.* 10s., High-st., Croydon, reversion in 84 yrs., 11,500*l.*; f.g.r. of 16*l.*, Handcroft-rd., ditto in 39 and 48 yrs., 480*l.*; f.g.r. of 20*l.* 10s., Windmill-rd., ditto in 64 and 66 yrs., 455*l.*—By *Glasier & Sons:* 1, Old Compton-st., Soho, f., r. 90*l.*, 2,290*l.*; 40, Greek-st., f., r. 65*l.*, 1,450*l.*; 21, Greek-st., f., r. 50*l.*, 1,500*l.*; "The George and Dragon" Public House, Greek-st., f., r. 80*l.*, 2,000*l.*; f.g.r. of 45*l.*, Hoxton-st., Hoxton, reversion in 33 yrs., 1,425*l.*; 99, 103, 105, Harrow-rd., Paddington, u.t. 44 yrs., g.r. 31*l.* 10s., r. 190*l.*, 2,255*l.*; 71, Weedington-rd., Kentish Town, u.t. 64 yrs., g.r. 7*l.*, r. 50*l.*, 630*l.*; 4 and 6, Oval-rd., Regent's Pk., u.t. 69 yrs.,

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENT.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Alterations to and Renovation of Church	Bristol Cemetery Co.	.....	April 29
*Scheme for Sewerage Disposal	Ludlow Corporation ..	25*l.* 15*l.* 10*l.*	May 30
*Public Baths	Leeds Corporation	.....	May 31
*Laying-out Proposed Park.....	BoroofWolverhampton	50*l.* 25*l.*	June 24
*Sewerage Works.....	Leipsic Town Council	5,000, 3,000, and 2,000 Marks	Oct. 1
School Premises, Bedminster	Bristol School Board..	.....	No date
Drainage Scheme and Sewage Disposal....	Southwold-on-SeaCorp.	.....	do.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*New Gas Works, &c.	Wallasey Local Board	*Official*	April 24
Laying, &c. Water Main.....	Bury Corporation	do.	April 25
Drain Pipes, Cement, Flags, &c.....	Tynemouth Corp.	do.	do.
Class-room, &c. Machen, Wales	Machen & Waen Fawr (U.D.) School Board	E. A. Lansdowne	do.
Paving, &c. (one street)	Bursalem Corp..... ..	F. Bettany.....	do
Draining, Paving, Kerbing, &c. (one road)	Horwich Local Board	J. E. Jackson	do.
Banking Premises, Leigh	Union Bank of Manchester	W. Waddington & Son	do.
Two Main Pipe Sewers, &c.	Wakefield U.R.S.A. ..	F. Massie	do.
School Buildings	Wednesbury Sch. Bd.	Joynson Bros.	do.
Eight Houses, Lidget Green, Bradford....	.....	S. Robinson	do.
Shop and Residence, &c. Barnstaple	Feoffees Barnstaple Long Bridge	F. W. Petter.....	do.
[Construction, &c. of Seven Streets.....	West Hartlepool Corp.	J. W. Brown.....	do.
Chapel, Class-room, &c. Egremont, Cumberland	Rev. T. Markwell	W. G. Scott	do.
*Sewers Works.....	West Ham Council....	Lewis Angell.....	do.
*Pipe Sewer, &c.	Willesden Local Board	O. Claude Robson	do.
Two Deep Sewers, Hamilton, N.B.....	Lanark County Council	J. Tait.....	April 26
Brick Sewer, &c.	Halifax Corporation ..	E. R. S. Escott.....	do.
Extension of and Alteration to Hotel Buildings, Porth	Ely Brewery Co. Lim.	J. Rees	do.
Storm-water Drainage Works (2,100 yds.)	Watford Local Board..	H. M. Turner	do.
Ten Houses, Belfast.....	.....	J. Fraser & Son	do.
Dwelling-house, Barnsley	.....	H. Crawshaw	do.
Iron Castings, Grids, &c.	Southport Corp.	W. Crabtree	do.
Slaughter-houses, &c. Waterhouses, Durham	Crook Co-op. Society..	.....	do.
Wrought-iron Girders (297 tons).....	G.W.R. Co.	*Official*	do.
Excavating, Draining, &c. Ely Bridge, Cardiff	Glamorgan C. C.	do.	do.
Repairing Well, Fixing Pump, and other Works, Calbourne	Isle of Wight R.S.A.	do.	do.
Sewering, &c. (two streets)	Rochdale Corp.	do.	do.
*Broken Granite	Hackney Bd. of Wks.	do.	do.
Lifting and Re-laying Sewers, &c.....	Sunderland Corp.	do.	April 27
Electric Lighting Station Buildings	Aberdeen Town Coun.	do.	do.
Masonry, Retaining Wall, Concrete Impounding Sewer, and other Works	Barnstaple Twn Coun.	H. Masterton	do.
Eleven Houses and Shops, &c. Great Horton-road, Bradford	.....	J. H. Dixon	do.
Police Inspector's Quarters, Cells, &c. Matlock Bridge.....	Derbyshire C. C.	J. Somes Story.....	do.
Police Station, &c. Hessle	East Riding JointCom.	A Beaumont.....	do.
Cast-iron Pipes, 20 in. (900 tons)	Cardiff Corporation ..	J. A. B. Williams	do.
Parish Hall, Burry Port, Llanelly	.....	W. Griffiths	do.
Pipe Sewers and other Works, Ardingley	Cuckfield U.R.S.A.....	W. Beach	do.
Jarrah or Karri Wood Paving Blocks (155,000)	Vestry of St. Pancras	W. N. Blair	do.
Masonry (contract 1) amd Ironwork (contract 2) of Bridge.....	Carlisle Corporation ..	W. Howard-Smith	do.
School Buildings, Kelvedon, Essex	.....	F. Chancellor	do.
*Valve and Governor House	Sheffield Gas Light Co.	T. W. Stevenson	April 28
Restoration of Church, Llanthony.....	.....	J. Spencer.....	do.
Road Metal (1,205 cubic yds.)	Ashford Local Board..	W. Terrill	do.
Excavating, &c. Pipe Trench, &c.	Plymouth Corp.	E. Sandeman.....	do.
Wood Paving Blocks, &c. (266,000)	Ipswich Town Council	E. Buckham	do.
Outfall Sewer, &c.	Perth Police Com.	R. M'Killop.....	do.
Granite Road Metal, 300 tons	Wildmore Parish Sur.	*Official*	do.
Paving, Road-Making, and other Works ..	Walsall Corporation ..	do.	April 29
*Yellow Deal Wood Blocks	St. Marylebone Vestry	do.	do.
Re-building and Repairing Dykes (1,146 yds.)	Aberdeen T.C.	do.	do.
Various Drainage Works, Doncaster.....	Dun Drainage Com. ..	do.	do.
Sewerage and Paving Works, &c.	Leyland Local Board..	W. Wrennall.....	do.
Municipal Offices	Crompton Local Board	H. Cheetham.....	do.
Setts, Road Metal, Flagging, &c.....	Wolverhampton Corp.	R. E. W. Berrington ..	do.
*Making, Kerbing, &c. New Road, Beckenham	.....	Dunlop & Lightfoot ..	do.
Nave, Chancel, Aisle, Vestry, &c. to Church, Pentre	Rev. Precentor Lewis	E. M. Bruce Vaughan	do.
Class-rooms and other Additions to Schools, Abersychan	Trevethin Sch. Bd.....	E. A. Lansdowne	do.
Road Metal, &c.	Penarth Local Board	J. Court.....	do.
Alterations, &c. to Premises, Durham	Trustees of the "Shakespeare" British Workman	H. T. Graydon	do.
Board-room, Offices, Dwelling House, &c.	Hoole Local Board....	C. A. Ewing	do.
Water Supply Works, (large contract) Bathgate, Linlithgow	.....	J. & A. Leslie & Reid..	do.
Additions, Alterations, &c. to School Buildings	Llantrissant Sch. Bd.	J. J. Evans	do.
Purifiers and other Works.....	Dunfermline Gaslight Co.	T. Newbigging	May 1

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Erection of School.....	Heywood] Corporation	Woodhouse & Willoughby	May 1
Town Dwelling Houses	Bradford Corporation	J. H. Cox	do.
Granite Kerbs (2,000 ft.).....	Hastings Corporation	P. H. Palmer	do.
Cast-Iron Posts, and Wrought-Iron Bars, &c.....	Walmer Local Board..	J. E. Turner	do.
Portland Cement, &c.	do.	do.	do.
Pulling Down Victoria Bridge, Ilchester, and Erection of Iron Bridge	.....	A. J. Goodford.....	do.
Re-building Bridge, Tregony.....	Cornwall C.C.	T. J. Hicks.....	do.
Steel Rails (500 tons)	Epsom Downs, Extension Railway Co.	J. Wolfe Barry.....	do.
Six Houses, Baildon.....	.....	J. Robertshaw & Son..	do.
*Water Supply	Athlone Town Com.	W. G. Strype, & P. F. Comber.....	do.
*Yellow Deal Blocks	Paddington Vestry....	*Official*	do.
*Supply of Materials	do.	do.	do.
*Broken Granite	St. Alban's Corp.	do.	do.
*Surface Water Sewers, &c.....	TottenhamLocal Board	J. E. Worth	May 2
Sewering, Levelling, Kerbing, Metalling, &c. (five streets)	Sutton Coldfield Corp.	F. F. Marston	do.
Road Metal, &c.....	Staffordshire C. C.	J. Moncur	do.
Three-lift Gasholder, &c.	Widnes Corporation ..	J. Carr	do.
Sewage Disposal Apparatus	Glasgow Police Com..	G. V. Alsing.....	do.
*Iron Railing and Gates	Torquay Corporation..	H. O. Garrett.....	do.
*Erection of Thirty-four Houses, Leeds....	North-Eastern Railway	W. Bell	May 2
*Pier Painting	Southend-on-Sea Corp.	*Official*	do.
*Electric Lighting Station	Kingston - on - Thames Corporation	do.	do.
*Fifty-seven Cupboards, Western Hospital	Met. Asylums Board	do.	May 4
Various Road Works, Mayo, Galway, and Kerry	The Congested Districts Board of Ireland	do.	do.
Villa Residences, Dobcross, Oldham	.....	J. Kirk & Sons.....	do.
*Firing Battery, Drill Shed, &c. Scarboro'	Admiralty	*Official*	May 5
*Making-up Road	Wanstead Local Board	do.	do.
Chapel, Roundhay-road, Leeds.....	.....	G. F. Danby	do.
*Police Station, Boscombe	County of Southampton	J. Robinson	May 6
*Alterations to Infirmary.....	Hendon Union.....	*Official*	do.
*Making-up Roads	Hornsey Local Board..	T. de Courcey Meade..	May 8
*Construction of Sewer.....	do.	do.	do.
*Sewerage Works, &c. &c.	do.	do.	do.
*Sewerage Works.....	Barry and Cadoxton Local Board	C. R. Walker	do.
Superstructure of Guildhall	Cambridge Twn Coun.	W. M. Fawcett.....	do.
*Renewing Brickwork of Reservoirs, &c..	Southampton Corp. ..	W. Matthews	May 9
Quarrying, &c. Road Metal, &c. Aboyne, N.B.	.....	J. Milne	May 10
*Erection of Dining-hall, &c. &c. at Workhouse	Strood Union	G. E. Bond	May 11
Guernsey Granite (1,100 tons)	Poole Town Council ..	J. Elford	do.
Brick or Cast-iron Pipe Sewer, &c.....	Moss Side Local Board	J. Bowden.....	May 12
*Waterworks.....	Barmouth Local Board	T. Roberts & Son.....	do.
*Post Office, Woking	Com. of H. M. Works	*Official*	do.
*Superstructure of New Asylum	Sunderland Asylum ..	G. T. Hine.....	May 27
*Construction and Maintenance of Sewerage Works	City of Cape Town....	Clement Dunscombe..	July 29 No date
Road Metal (250 tons)	Consingby U.S.A.		
Filling Works (20,000 cubic yds.), Carlisle	His Grace the Duke of Devonshire.....	C. J. Ferguson.....	do.
*Broken Granite, Wanstead	.....	J. T. Bressey.....	do.
Extension of Broadfield Mill, Heywood ..	R. J. Wood, J.P.....	J. E. Mills.....	do.
Sinking Well, &c. Broadfield Mill, Heywood.....	do.	do.	do.
Additions to several Houses, Botcherby, Carlisle	.....	H. H. Hodgkinson....	do.
Six Semi-detached Villas, Abergavenny ..	.....	E. A. Johnson	do.
Formation of Streets, Sewers, &c. Cathays, Cardiff	Heath Property Co. Ltd.	Veall & Sant.....	do.
Sewering, Forming, &c. one street, Hucknall-under-Huthwaite	.....	W. Dodsley	do.
Four Cottages, Wigan	J. Arrowsmith.....	W. B. Johnson & Sons	do.
One Single and Two Semi-Detached Houses, Wigan.....	.....	W. G. V. Compton....	do.
Business Premises and Two Cattages, Castleton	Rochdale Equitable Pioneers' Society Ltd.	Butterworth & Duncan	do.
Gas Holder Tank	Chesterton Gaslight Co. Ltd.	*Official*	do.
Four Houses, Blackpool.....	R. Holden	do.	do.
Chapel, Bishopston (Bristol).....	.....	H. J. Jones	do.
Sinking Shaft 200 Fathoms, New Cumnock, Glasgow	Lanemark Coal Co. Ltd.	R. W. Dron	do.
Residence, &c. Epsom	.....	J. H. Smith	do.
Pipe Sewer, Kelham.....	*Southwell U.R.S.A. ..	J. Garratt	do.
One Detached, and a Pair of Semi-Detached Residences, Llanelly	.....	W. Griffiths	do.
Additions to Co-operative Store	Backworth Co-operative Society	.....	do.
Two Pairs of Semi-Detached Villas, Brockley.....	.....	E. Clarke	do.
Additions to School Buildings.....	Kinson School Board	Lawson & Donkin	do.
Granite Setts, Kerbs, Flagging, &c.	Manchester Corp.	*Official*	do.
*Two Pairs of Villas, Brockley-road.....	.....	*Edward Clarke.....	do.

PUBLIC APPOINTMENT.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Inspector of Nuisances, Surveyor, &c.	Ware U.R.S.A.	120*l.*	May 1

Those marked with an Asterisk (*) are advertised in this number. *Competitions, p.* iv *Contracts, pp.* iv., vi., viii., *and* xxiii. *Public Appointment, p.* xi.

g.r. 14*l.*, r. 90*l.*, 905*l.*—By *Stimson & Sons:* 89, Burton-rd., Brixton, u.t. 21 yrs., g.r. 5*l.* 4s., 265*l.*; No. 763, Old Kent-rd., u.t. 18 yrs., g.r. 18*l.* 18s., r. 52*l.* 10s., 180*l.*; No. 761, u.t. 18 yrs., g.r. 9*l.* 12s., r. 40*l.*, 110*l.*; 1 to 7, Goodes-ct., Newington Causeway, u.t. 16 yrs., g.r. 4*l.*, 100*l.*; 19, 21, and 23, Mann-st., Walworth, u.t. 58 yrs., g.r. 15*l.* 15s., 800*l.*; No. 215, Blackfriars-rd., f., 1,000*l.*; 1, Box-st., Bromley-by-Bow, u.t. 70 yrs., g.r. 3*l.*, 40*l.*—By *H. J. Bliss & Sons:* 17, 28, and 30, Ellesmere-road, Bethnal Green, f., 1,110*l.*; 77, 79, and 81, Coventry-st., u.t. 17 yrs., g.r. 11*l.* 5s., 260*l.*; 50, Jane-st., St. George's-in-East, u.t. 8 yrs., g.r. 9*l.*, 57*l.*; 42 and 44, Bacon-st., Bethnal Green, f., 675*l.*; 63 and 65, Ormsby-st., Kingsland, u.t. 13 yrs., g.r. 4*l.*, 160*l.*—By *Worsfold & Hayward* (At Dover): 2 and 11, Trevanion-st., f., 380*l.*; 7, Alexander Cottages, f., 145*l.*; f. House, St. Margaret's-at-Cliffe, 220*l.*; Six plots of f. land, 15a. 2r. 9p., 184*l.*; Four f. Cottages, Barn, &c., 230*l.*

APRIL 14.—By *W. Bradly:* 7, Annandale-rd., Greenwich, f., r. 35*l.*, 470*l.*; 65 to 68, Ashburnham Grove, u.t. 53 yrs., g.r. 18*l.*, r. 112*l.*, 1,055*l.*; 11, South Crescent, u.t. 20 yrs., g.r. 2*l.* 10s., 100*l.*—By *W. B. Hallett:* l.g.r. of 63*l.*, Forest Hill, u.t. 67 yrs., g.r. 9*l.*, 1,065*l.*—*Towers, Ellis, & Co.:* 52, Burlington-rd., Bayswater, u.t. 66 yrs., g.r. 12*l.*, r. 60*l.*, 300*l.*; 112, Inverness-ter., u.t. 45 yrs., g.r. 10s., r. 106*l.*, 1,450*l.*; 83, Inverness-ter., u.t. 56 yrs., g.r. 8*l.*, r. 115*l.*, 1,450*l.*; 20, Kensington Gardens-ter., Hyde-pk., u.t. 40 yrs., g.r. 12*l.* 10s., 1,400*l.*; 11, Westbourne Mews, u.t. 34 yrs., g.r. 20*l.*, r. 68*l.*, 430*l.*; 13, Shelden-st., u.t. 44 yrs., g.r. 10*l.*, r. 75*l.*, 700*l.*—By *J. W. Reed:* 54, Rossiter-rd., Balham, u.t. 80 yrs., g.r. 8*l.*, r. 30*l.*, 310*l.*—By *Jenkins & Sons:* 2, South Parade, Bedford-pk., f., r. 70*l.*, 750*l.*; 6, Roman-rd., f., r. 40*l.*, 420*l.*; two plots of f. land, in rear of Bath-rd., 310*l.*; 40, Bath-rd., u.t. 81 yrs., g.r. 10*l.*, r. 50*l.*, 400*l.*; 42 and 50, Bath-rd., u.t. 81 yrs., g.r. 20*l.*, r. 110*l.*, 790*l.*; 6 and 8, Conewood-st., Highbury, f., r. 53*l.* 4s., 760*l.*; 24, Brunswick-sq., Camberwell, u.t. 48 yrs., g.r. 10*l.*, 225*l.*—By *Newbon & Co.:* 29 and 31, Paxton-rd., Chiswick, f., 450*l.*; 20, Prah-rd., Finsbury-pk., u.t. 78 yrs., g.r. 4*l.* 5s., r. 34*l.*, 340*l.*; 10 and 12, Hornsey Rise, Hornsey, u.t. 58 yrs., g.r. 20*l.*, 965*l.*; "Grove Lodge," Grove-rd., Southgate, f., 800*l.*; 41 to 44, Harrowgate-rd., Hackney, u.t. 51 yrs., g.r. 16*l.* 16s., 955*l.*; 6 and 8, Spurstowe-rd., u.t. 66 yrs., g.r. 10*l.*, 760*l.*; 17 and 19, Spurstowe-rd., u.t. 69 yrs., g.r. 11*l.*, r. 72*l.*, 625*l.*

[*Contractions used in these Lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.

Greenheart, B.G.	ton	9/0/0	0/0/0
Teak, E.I.	load	9/0/0	15/0/0
Sequoia, U.S.ft.cu.		2/3	2/6
Ash, Canada	load	2/10/0	4/0/0
Birch, do.		3/0/0	4/0/0
Elm, do.		3/10/0	4/10/0
Fir, Dantsic, &c.		1/10/0	3/5/0
Oak, do.		3/0/0	5/5/0
Canada		5/10/0	7/0/0
Pine, Canada red		2/10/0	3/10/0
Do. Yellow		2/10/0	4/10/0
Lath, D'ntsic, fath		5/0/0	6/0/0
St. Petersburg		5/0/0	7/0/0
Deals, Finland			
2nd & 1st std	100	7/0/0	9/10/0
Do. 4th & 3rd		6/10/0	7/0/0
Do. Riga		6/10/0	8/0/0
St. Petersburg, 1st yellow		10/0/0	14/0/0
Do. 2nd yellow		8/0/0	9/0/0
Do. white		8/0/0	10/0/0
Swedish		7/0/0	15/10/0
White Sea		8/0/0	16/10/0

TIMBER (*continued*).

Canada, Pine 1st		21/0/0	28/10/0
Do. do. 2nd	....	15/10/0	17/10/0
Do. do. 3rd	&c.	7/10/0	10/5/0
Do. Spruce, 1st		8/10/0	11/0/0
Do. do. 3rd & 2nd	.....	6/15/0	8/0/0
New Brunswick		6/10/0	7/10/0
Battens, all kinds		3/0/0	15/0/0
Flooring boards, sq., 1 in. prep.	1st	0/9/0	0/15/6
Do. 2nd	.....	0/8/0	0/11/6
Other qualities—		0/4/6	0/7/6
Cedar, Cuba	..ft.	/4	/4½
Honduras,	..&c	/4	/4½
Mahogany, Cuba		/4½	/6½
St. Domingo,	cargo av.	/4	1/6
Mexican do. do.		/3½	/4½
Tobasco do. do.		/3½	/6½
Honduras do.	..	/4½	/6
Box, Turkey	ton	4/0/0	13/0/0
Rose, Rio	.....	9/0/0	20/0/0
Bahia	.....	8/0/0	18/0/0
Satin, St. Domingo	.....ft.	0/0/6	0/1/3
Porto Rico	.....	0/0/7	0/1/6
Walnut, Italian	..	0/0/3½	0/0/7

METALS.

Iron—Pig, in Scotland	.....ton	2/0/8	0/0/0
Bar, Welsh, in London	..... c.	5/17/6	6/0/0
Do. do. at works in Wales	.....	5/7/6	5/10/0
Do. Staffordshire, in London	.....	6/0/0	6/10/0
COPPER—British, cake and ingot		47/15/0	48/5/0

METALS (*continued*).

Best selected	..	49/0/0 49/10/0
Sheets, strong	..	55/10/0 57/10/0
Chili, bars	.....	44/13/0 45/1/3
YELLOWMETAL	lb	0/4 13-16 /5
LEAD—Pig, Spanish	.....ton	9/13/9 9/15/0
English com. brands	.....	9/16/3 9/18/9
Sheet, English, 6 lbs. per sq. ft. and upwards	....	11/5/0 0/0/0
Pipe	.....	11/15/0 0/0/0
ZINC—English sheet	.....ton	21/10/0 0/0/0
Vieille Montagne	.....	22/0/0 0/0/0
TIN—Straits	.....	94/15/0 94/12/6
Australian	.....	94/15/0 95/5/0
English Ingots	..	97/0/0 97/10/0
Banca	.....	94/15/0 95/0/0
Billiton	.....	94/10/0 94/15/0

OILS.

Linseed	.....ton	20/10/0 20/15/0
Cocoanut, Cochin		29/0/0 0/0/0
Do. Ceylon	.....	26/15/0 0/0/0
Palm, Lagos	.....	30/0/0 30/10/0
Rapeseed, English pale	.....	25/10/0 25/15/0
Do. brown	.....	24/0/0 0/0/0
Cottonseed ref.	...	22/10/0 23/0/0
Oleine	.....	23/0/0 24/0/0
Lubricating, U.S.		4/0/0 5/0/0
Do. refined	.....	5/10/0 22/0/0
TAR—Stockholm	barrel	0/12/6 0/0/0
Archangel	.....	0/12/6 0/0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.*]

ALTRINCHAM.—For alterations and additions to the Literary Institution, for the Local Board. Mr. Frank Popplewell, architect, 82, Mosley-street, Manchester. Quantities by the architect:—

Martin Stone	£4,320	W. Lambert & Son, Altrincham*	£4,240
Simon Johnson	4,313		
James Hamilton	4,307	R. Campbell	4,205

* Accepted.

BARNSLEY.—Accepted for the enlargement of school buildings, Hoyland Common, for the Hoyland and Nether School Boards. Mr. W. J. Sykes, architect, Hoyland, Barnsley. Quantities by Mr. W. J. Sykes:—

Mason.—W. A. Hague, Hoyland Common, near Barnsley	£624	0	0
Joiner.—Haydn Brearley, Hoyland Common	360	0	0
Slater.—A. Calvert, High Green, near Sheffield..	74	0	0
Plasterer.—Jas. McPartlain, Platts Common, near Barnsley	25	0	0
Plumbers, &c.—Firth & Sons, Hoyland, near Barnsley	102	0	0

BERSHAM (Wales).—For the erection of a cemetery entrance lodge, Coedpoeth, for the Burial Board. Messrs. Lash & Gant, architects:—

Seth Jones	£398	Richard Griffiths	£320
Wm. Owen	345	Samuel Moss	284
E. Bird	340	Hughes & Owen	272

BLAENAVON (Mon.).—For the erection of a schoolmaster's residence, for the Trevethin School Board. Mr. E. A. Lansdowne, architect, Newport, Mon.:—

John Burgoyne, Blaenavon* £475 0 0

* Accepted subject to the approval of Education Department.

[Lowest of four tenders submitted.]

BOURNEMOUTH.—For the erection of a hotel, Lansdowne Park. Messrs. H. E. Hawker & Mitchell, architects, St. Peter's-chambers, Bournemouth:—

Tilsed	£1,991	Curtis	£1,747
Buckingham	1,950	Bath	1,697
W. Hoare	1,943	Lucas	1,695
Masters & Knight	1,885	Entwistle & Cox, Bournemouth*	1,588
F. Hoare	1,809		
Jenkins & Sons	1,794		

* Accepted.

BRADFORD (Yorks).—Accepted for the erection of engine-house, &c., and taking down chimney, at Upper Croft Mills, Bowling, for Messrs. L. Leadley & Son, architects, 3, Coleridge-place, Bradford. Quantities by the architects:—

Mason, Bricklayer, Carpenter, and Joiner.—John Moulson & Sons, Bradford .....
Plumber.—Arthur Watson, Bowling Back-lane, Bradford .....
Plasterer.—John Leach, 1,256, Leeds-road, Bradford .....
Slater,—Thornton Brothers, Bradford £1,345 0 0

BROMLEY (Kent).—For painting works at "The Rookery," Bromley Common, Kent, for Mr. A. C. Norman. Messrs. Waring & Nicholson, architects, 55, Parliament-street, Westminster. Quantities supplied:—

W. Lott & Sons	£449	T. Lapthorne & Co.	£280
Wm. Smith	284	Douglas Payne (accepted)	252

BROMLEY (Kent).—For new billiard-room and lavatory at the Bromley Conservative Club. Messrs. Wadmore, Wadmore, & Mallett, architects:—

D. Payne	£227	F. P. Duthoit	£172
T. D. Graty	189		

BURSLEM.—For the erection of terrace-walls, &c., in the Borough Park, for the Corporation. Mr. F. Bettany, Borough Engineer and Surveyor:—

W. Grant	£560	N. Bennett (accepted)	£520
W. Cooke	544	J. Windsor	490

BURSLEM.—For the erection of lodge and main entrance to the Borough Park, for the Corporation. Mr. F. Bettany, Borough Engineer and Surveyor:—

N. J. Bennett	£916	17	N. Bennett* £770 0
W. Grant	850	0	F. W. Jackson 730 0
W. Cooke	816	0	

* Accepted.

CARDIFF.—For erecting a pair of semi-detached villa residences, Dinas Powis, near Cardiff. Mr. W. H. Dashwood Caple, architect, 1, St. John's-square, Cardiff:—

Knox & Wells	£1,485	E. C. Newby	£1,125
Stephens, Bastow & Co., Limited	1,399	H. J. Money	1,100
Jenkins & Arnold	1,195	W. Richards	1,070
		W. Rees	943

EASTLEIGH (Hants).—For carrying out certain sewerage works at Eastleigh, Hants, for the South Stoneham Rural Sanitary Authority. Mr. H. J. Weston, Engineer:—

Lloyd & Powell	£13,250	0 0	F. Reeks £9,527 0 0
Cook & Co.	11,634	0 0	Morgan, Isted, & Morgan 9,426 0 0
T. P. Hall	11,600	0 0	Crook & Son, Southampton (accepted) 9,344 0 0
H. I. Sanders	11,000	0 0	
Young & Son	10,594	13 8	

[Engineer's estimate, £7,838.]

ELLESMERE PORT (Cheshire).—For forming, metalling, kerbing, &c., seven streets, for the Wirral Rural Sanitary Authority. Messrs. C. H. Beloe and F. E. Priest, engineers, 13, Harrington-street, Liverpool:—

Holme & King	£9,204	1 9!	L. Marr & Son £5,817 4 8
F. S. Bennie	6,337	0 0	Morgan & Halewood 5,777 7 0
J. Young & Son	6,260	12 0	Peter Balmer, Aintree (accepted) .. 4,929 0 0!
W. A. & John Scott	6,252	9 2	
Brown Phillips & Co.	5,953	14 6	

HANWELL.—For constructing 350 ft. of 18-in. pipe drain and other works, at the Hanwell Cemetery. Mr. E. Monson, junr., architect:—

Seiff Bros.	£398	Merecroft	£298
Wells	385	Parker	282
Nowell & Robson	350	Lee	238
Rogers & Co.	343	Wimpey & Co.	222

HAVANT (Hants).—For alterations to the "Bear Hotel." Mr. Edwin Stallard, architect, West-street, Havant:—

A. & E. Sprigings	£320	0 0	H. Carrell £289 3 6
J. Staples	312	9 6	W. Rogers, Havant* 289 3 6

* Accepted.

HAVERHILL (Suffolk).—For telescoping a single lift gas-holder to additional lift, for the Local Board. Mr. Brooke Gibson, Engineer:—

S. Cutler & Sons	£524	Ashmore, Benson, Pease, & Co., Stockton-on-Tees* ..	450
Woodhouse & Rawson, Limited	502	Willing & Co., Exeter†	399
E. Cockey & Sons	462		

* Pease's Patent Wire Rope System. † Accepted.

HOVE (Sussex).—For the construction of a sea-wall, groynes, esplanades, &c., near Medina Quarter Deck, Hove, for the Hove Commissioners. Mr. H. H. Scott, Town Surveyor, Town Hall, Hove, Brighton:—

J. Longley & Co.	£11,832	0 0	J. Parsons & Sons ..£8,549 0 0
T. Chappell	11,783	0 0	W. Hill & Co., Gosport (accepted) .. 8,187 0 0
J. Rand	10,750	0 0	T. P. Hall 8,074 0 0
G. Lawson	10,199	0 0	Morgan, Isted, & Morgan 7,946 0 0
J. Cochran & Sons	10,068	12 7	
Wilkinson Bros.	9,924	0 0	
G. Bell	9,253	0 0	Herbert Weldon 7,664 0 7

KINTBURY (Berks).—Accepted for alterations and additions to Barton Court. Mr. J. Money, architect, Newbury:—

G. Elms, Benham £2,831 17 4

LONDON.—For the erection of diphtheria wards at the Western Hospital, Seagrave-road, Fulham, for the Metropolitan Asylums Board. Messrs. A & C. Harston, Architects, 15, Leadenhall-street, E.C. Quantities by Mr. W. T. Farthing, 46, Strand:—

W. H. Lascelles & Co.	£12,297	W. H. Wall & Co.	£10,945
Bulled & Co.	11,646	Leslie & Co.	10,691
F. G. Minter	11,490	W. Johnson & Co., Ltd., Wandsworth-common*	10,487
C. Miskin	11,340		

* Accepted.

LONDON.—For additional staff accommodation, discharge-rooms, &c., at the South Western Hospital, Stockwell, S.W., for the Managers of the Metropolitan Asylum District. Mr. Thos. W. Aldwinckle, Architect:—

W. & H. Castle	£9,526	19 5	Whitehead & Co. ..£8,250 0 0
E. P. Bulled & Co.	9,376	0 0	Barlow & Roberts .. 8,107 0 0
Leslie & Co.	9,248	0 0	W. Johnson & Co. .. 8,100 0 0
G. E. Todd	8,535	0 0	W. H. Lorden & Son 7,991 0 0
G. A. & H. Wall & Co.	8,310	0 0	Rirk & Randall 7,953 0 0
			T. White & Son* .. 7,444 12 8

*Accepted.

LONDON.—For painting and repairs at the South-Eastern Hospital, New Cross, S.E., for the Managers of the Metropolitan Asylum District. Mr. Thos. W. Aldwinckle, Architect:—

G. E. Bryan & Son	£3,097	0	Batchelor £1,744 12
W. H. Castle & Co.	1,994	0	E. Proctor 1,380 0
Lilly & Lilly, Limited..	1,779	0	T. Gordge & Co. 1,350 0
Jenrick & Crocker	1,765	0	F. C. Stokes & Co.* .. 1,207 0
T. White & Son	1,750	0	

* Accepted.

LONDON.—For two iron shelters at South Wharf, Rotherhithe, S.E., for the Managers of the Metropolitan Asylum District. Mr. Thos. W. Aldwinckle, Architect:—

F. & H. F. Higgs	£1,999	J. Mills	£1,896
W. Johnson & Co., Ltd...	1,960	H. Wall & Co. (accepted).	1,736

LONDON.—For painting and repairs at the South-Western Hospital, Stockwell, S.W., for the Managers of the Metropolitan Asylums District. Mr. Thos. W. Aldwinckle, Architect:—

F. W. Thomas	£1,456	10	Jenrick & Crocker £894 0
Barber & Olliver	1,313	0	M. Batchelor 854 13
White & Son	1,208	0	Taylor & Son 848 0
Jones & Tresise	1,154	0	Stewart & Co. 842 0
E. Proctor	1,083	0	W. & E. Mills 773 0
Vigor & Co.	1,019	10	Stokes & Co. 765 0
W. Scott	924	0	W. Akers & Co.* 727 0
Lilly & Lilly, Limited ..	917	0	

* Accepted.

LONDON.—For the erection of new laundry, receiving room, and ashes shed, and making alterations to the mortuary, at the Eastern Hospital, The Grove, Homerton, for the Metropolitan Asylums Board. Messrs. A. & C. Harston, Architects, 15, Leadenhall-street, E.C.:—

Barrett & Power	£671	Jas. Edmunds, 1, Kerbey-street, Poplar, E.*	£542
W. H. Wall & Co.	620		

* Accepted.

LONDON.—For alterations at "The Pitt's Head" public-house, Old-street, E.C., for Mr. A. Krische:—

G. E. Todd	£429	0 0	J. & F. Bane £336 10 0
N. Thomas	355	0 0	Worden & Easton* .. 330 0 0
E. H. Walker	346	0 0	
Gas Fittings.			*Pewtering.*
Ungar & Co.*	£25	6 6	W. Paddon, jun.* £33 0 0

*Accepted. *Accepted.

LONDON.—For alterations at "The Lord Morpeth" public-house, Old Ford-road, E., for Mr. James Johnson:—

E. H. Walker	£403	Worden & Easton	£354
J. & F. Bane	369	John Woodage (accepted)..	346

LONDON.—For erecting shop and dwelling-house, 720, Old Kent-road, for Mr. E. W. Ellis. Messrs. Waring & Nicholson, architects, 55, Parliament-street, Westminster:—

H. Joyce	£864	T. Lapthorne & Co.	£689
C. King	710	W. L. Simpson (accepted)..	570

LONDON.—For the construction of additional drainage to the cemetery, Garrett-lane, Tooting, for the Streatham Burial Board. Mr. W. Newton Dunn, architect, 1 and 2, Bucklersbury, E.C.:—

G. Wimpey & Co.	£590	Thos. Adams	£517
W. Neave & Son	547	Peill & Sons	490
Fuller, Braund & Co.	540	G. Impey	347

LONDON.—For interior cleaning at Graystoke-place, Fetter-lane, for the School Board for London. Mr. T. J. Bailey, Architect:—

Williams & Son	£119	10 0	Marchant & Hirst .. £102 15 0
Hornett	117	0 0	Vigor & Co. 84 10 0
Johnson & Co.	109	14 6	

LONDON.—For interior cleaning at Barrow Hill-road School, for the School Board for London. Mr. T. J. Bailey, Architect:—

Sealey	£182	0	Marchant & Hirst £136 0
Williams & Son	152	0	Eady 97 0
Cowley & Drake	149	17	

LONDON.—For interior cleaning at Princeton-street School, for the School Board for London. Mr. T. J. Bailey, Architect:—

Williams & Sons	£207	0	Hornett £197 10
Eyers	289	0	Taylor & Son 191 0
Macey & Son	247	0	Johnson & Co. 184 0
Stevens & Son	228	0	Vigor & Co. 176 0
Marchant & Hirst	198	0	

LONDON.—For painting and cleaning at Pultney-street School, for the School Board for London. Mr. T. J. Bailey, Architect:—

Graham & Graham	£436	Mowlem	£359
Hornett	391	Deathe & Axtell	355
Kent	376	Machant & Hirst	345

LONDON.—For interior cleaning at Great College-street School, for the School Board for London. Mr. T. J. Bailey, Architect:—

Eyers	£523	0 0!	Williams & Son £174 0 0
Kirby & Chase	509	0 0	Houghton & Son .. 162 15 10
Cowley & Drake	211	2 6	Stevens Bros. 157 0 0
Salter	189	0 0	Marchant & Hirst .. 139 0 0!

LONDON.—For interior cleaning at Netley-street, for the School Board for London. Mr. T. J. Bailey, Architect:—

Kirby & Chase	£275	0 0!	Johnson & Co. £103 2 6
Eyers	265	0 0	Houghton & Son .. 94 10 0
Vigor & Co.	192	10 0	Marchant & Hirst .. 74 10 0!
Hornett	113	10 0	

LONDON.—For rebuilding three houses, Nos. 44, 46, 48, Dean-street, St. George's-in-the-East. Mr. S. James, architect, Upper Park, Loughton:—

Howlett	£705	15	Mantor £618 0
Sims	627	0	Calnan 439 0

LONDON.—Accepted for mahogany fittings and decorations at the "Black Bull," Haggerstone. Mr. C. Stimer, architect:—

W. Vanstone £130 0 0

LONDON.—Accepted for refitting saloon bar, &c., at the "Blue Last." Mr. C. Stimer, architect:—

W. Vanstone £474 0 0

LONDON.—For repairs and painting at Cleveland-street Sick Asylum, for the Managers. Mr. Wm. S. Cross, architect, 18, Outer Temple, Strand. Quantities by Messrs. Northcroft, Son, & Neighbour:—

	A.			B.		
J. & H. Bangs	£621	10	0	£347	0	0
Howard & Co.	478	9	0	—		
W. T. Ballard	434	7	0	—		
F. T. Chinchen	422	10	0	340	0	0
H. Wall	414	0	0	350	0	0
Edward Proctor	400	15	0	280	0	0
Buckeridge Bros.	400	0	0	—		
Dorrell & Co.*	379	0	0	230	0	0
J. & E. Bowyer	378	0	0	—		
Matthews Bros.	366	0	0	252	0	0
McMillan & Houghton	365	0	0	323	0	0
W. Wright	341	0	0	—		
W. Scott	307	17	0	—		
T. Gough & Co.	294	0	0	370	0	0
R. Seed	290	0	0	255	15	0
W. & E. Mills	260	0	0	192	0	0

* Accepted for both.

A. External Painting and Pointing.
B. Interior Cleaning and Whitewashing.

LONDON.—For the erection of a bakehouse, 686, Old Kent-road, S.E., for Mr. Schaub. Messrs. T. & W. Stern, architects, 2, Great Winchester-street, E.C.:—

F. G. Higgs	£589	Balaam Brothers	£495
H. Joyce	528	W. Holding & Sons	412
A. & W. Garnar	498		

LONDON.—For alterations to "Silver Tavern," Burdett-road, for Mr. Thomas C. Cooper. Mr. Charles Brown, surveyor, 162, Campbell-road, Bow:—

Edmunds	£358	G. Barker	£288
Sheffield Brothers	323	Charles L. Cole (accepted)	280

LONDON.—For making-up and paving Moylan-road, Fulham, for the Vestry. Mr. W. Sykes, New Streets Surveyor, Town Hall, Walham Green, London, S.W.:—

	A	B	C	D	E
Rogers & Co.	323	200	—	—	—
Wimpey	307	187	133	—	—
Woodham, Fry, & Fry.	—	185	129 10	166 19	139 2 6
Mears	310	—	—	—	—
Greenham	320	—	—	—	—
Imperial Stone Co.	—	—	—	—	139 0 0
Parry	330	207 10	—	—	—

A Roadway. B York. C Patent Adamant. D Victoria. E Imperial.

LONDON.—For repairs to be done to houses, Nos. 124 and 126, Green-street, Bethnal Green-road, for Miss Bayley. Mr. W. F. Potter, architect:—

C. Smith	£147	F. Dawes, Peckham Rye*	£115

* Accepted.

LONG REACH.—For the erection of a male staff block, patients' discharge block, and other works on shore, at the Smallpox Hospital Ships at Long Reach, near Dartford, Kent, for the Metropolitan Asylums Board. Messrs. A. & C. Harston, Architects, 15, Leadenhall-street, E.C.:—

J. Ellingham	£3,395	C. Miskin	£2,790
Leslie & Co.	2,992	W. Johnson & Co., Ltd., Wandsworth-common*	2,483
W. H. Wall & Co.	2,973		

* Accepted.

MILLOM.—For the erection of a farm-house, Whitridge Close, for Mr. J. Atkinson. Mr. Albert E. Bradley, 15, Horn Hill Terrace, Millom:—

Wm. Tomlinson	£680	0	H. K. Richardson, Catherine-st., Millom*	£603	0
Wm. Bradley	629	7			

* Accepted.

MORPETH.—Accepted for three new houses, for Mr. John Appleton, High Stanners, Morpeth. Mr. George Reavell, jun., architect, Alnwick and Morpeth:—

Mason.—Thos. W. Middlemiss, Morpeth	£360 8 0
Joiner.—John Bryson, Morpeth	214 16 0
Plumber.—J. T. Daglish, Morpeth	23 0 6
Plasterers.—R. & T. Fairbairn, Morpeth	61 11 6
Slater.—J. Purdie, Alnwick	37 15 6
Painter.—A. McGee, Morpeth	24 0 0
Total	£721 11 6

NEWHAVEN (Sussex).—For the erection of a Wesleyan chapel, for the Trustees. Mr. Charles Bell, architect:—

G. Chapman	£1,058	A. Knight	£950
W. Hill	1,050	C. Morling, Seaford*	893

* Accepted.

NEWPORT (Mon.).—Accepted for the erection of five villa residences on the Springfield Park Estate, Newport, for the Springfield Park Building Company Limited. Mr. E. A. Lansdowne, architect:—Quantities by the architect:—

John Linton, Newport £3,750 0

[No competition.]

NORMANTON.—For the formation and flagging of Princess-street, for the Local Board. Mr. A. Irvine, Surveyor, Local Board Office, Normanton:—

Jas. Bramham	£390 0 0
Fred Denison, Normanton (accepted)	330 0 0

NORWICH.—For the erection of schools at Avenue-road, Norwich, for the Norwich School Board. Mr. Chas. J. Brown, architect and surveyor, Cathedral Offices, Lower Close, Norwich:—

Downing & Sons	£10,544	H. Lacey	£9,925
G. E. Hawes	10,300	Chapman & Son*	9,694
Youngs & Sons	9,945		

* Accepted.

[All of Norwich.]

NOTTINGHAM.—For the erection of shedding, grand stand, offices, &c., at Colwick Park, for the Nottinghamshire Agricultural Society. Mr. W. H. Bradwell, Thurland-street, Nottingham:—

Marshall Bros., Old Lenton, Nottingham. [Accepted on a schedule of prices.]

PONTYPRIDD.—For the erection of an infant school at Pwllgwann, Pontypridd, for the Llantrisant School Board. Mr. J. Evans, architect, Sunnyside, Penarth:—

W. Seaton	£2,997	0 0	C. Jenkins & Sons.. £2,800 0 0
L. Evans	2,900	0 0	Watkin Williams, Pontypridd* 2,532 10 0
Jas. Williams	2,855	18 9	
D. Jones	2,827	10 0	

* Accepted.

[Architect's estimate £2,822]

REIGATE.—For the construction of precipitation works, sewers, &c., for the Town Council. Mr. F. D. Clark, C.E., Borough Engineer, Market Hall, Redhill:—

Contract No. 1.—Brickwork &c.

W. Cunliffe, Kingston-on-Thames* £11,584 0 0

Contract No. 2.—Machinery.

Manlove, Alliott, & Co., Nottingham* £2,033 0 0

* Recommended to Council for acceptance.

REIGATE.—For the construction of precipitation works, sludge-press house, iron syphon, and other incidental works, for the Council of Reigate. Mr. F. D. Clark, A.M.Inst.C.E., Borough Engineer, Redhill:—

W. Cunliffe, Kingston-on-Thames £11,584 0

[Recommended for acceptance.]

RICHMOND.—For furnishing the new Town Hall, for the Richmond Town Council. Mr. W. J. Ancell, architect, 3, Staple-inn, W.C. :—

F. Arthur	£3,068 12	White, Allom & Co., 8, Mount-street, Grosvenor-square*	£2,450 6
Felix & Wayman	3,026 8		
Gillow & Co.	3,014 6		
Lapworth Bros.	2,483 6		

*Accepted.

ROCHDALE.—For the construction of two precipitating tanks, two filter-beds, &c., at Smallbridge, for the Wuerdle and Wardle Local Board. Mr. J. Tertius Wood, engineer, Butts-chambers, Rochdale :—

Kershaw	£1,612 14 1	W. A. Peters & Sons, Townhead, Rochdale (accepted)	£1,155 13 4
Perkins, Graham & Co., Limited	1,383 14 3		

[Engineer's Estimate, £1,160].

SEAFORD (Sussex).—For the construction of about 2,400 yards of new roads, 1,600 yards pipe sewer, &c., Sutton Park Estate. Mr. G. A. Wallis, engineer, 14, Seaside-road, Eastbourne :—

W. H. Holman & Co.	£4,884 0 0	Perrin & Long	£3,468 0 0
Sydney Hudson	4,500 0 0	Joseph Jackson	3,427 17 4
Woodham, Fry, & Fry	3,997 8 0	W. Meats	3,148 0 0
Jas. Hayward	3,577 0 0	G. Bell, Tottenham*	3,115 0 0

*Accepted.

THORPE (Yorks).—Accepted for the erection of two semi-detached villa residences, for Captain J. Hunter. Mr. Robert Lennard, architect, Cliff-street, Whitby. Quantities by Mr. J. J. Milligan, Whitby :—

Mason, &c.—Emmeson Russell, Robin Hood's Bay	£735 0 0
Joiner.—Moorsholm Mennell, Robin Hood's bay	285 0 0
Plumber.—J. Brown, Whitby	101 2 0

THORNE (Yorks).—For alterations to the chapel for the Trustees of the Methodist New Connexion Chapel. Mr. Henry Kelsey, architect, Epworth :—

H. Kelsey	£443	Barton & Middleton, Thorne (accepted)	£416
W. H. Smith	430		

TOTTENHAM.—For building a villa residence at Whittington-road, Bowes Park, Tottenham, N., for Mr. J. T. Paul. Mr. Joseph G. Needham, architect and surveyor, 11, Powerscroft-road, Clapton :—

H. W. Say	£640	W. Wells (accepted)	£390
Worden & Easton	452		

WALSALL.—For the supply and erection of six cast-iron purifiers, connexions, valves, &c., at the Pleck Gas Works, for the Corporation. Mr. John Tindall, engineer, Walsall :—

For a Set of Six Cast-Iron Purifiers.

C. & W. Walker, Donnington, Salop (accepted) £2,040

For Annular Condenser.

Clapham Bros., Keighley 520

For Eclipse Washer Scrubber.

Clapham Bros., Keighley 550

WEYMOUTH.—Accepted for erecting detached residence at Buxtons. Mr. S. Jackson, architect, Weymouth :—

J. Dunford, Weymouth £1,416 0 0

WEYMOUTH.—Accepted for the erection of seven houses, Dorchester-road. Mr. S. Jackson, architect, Weymouth :—

G. Willshire & Son, Dorchester £1 910 0 0

WREXHAM.—For the erection of school buildings, Rhosddu, for the Stansty School Board. Messrs. Lash & Gant, architects, 5, Temple-row, Wrexham :—

W. E. Samuel	£950	Hughes & Owen	£920
W. Rogers	945	E. Bradshaw, Wrexham*	809

* Accepted subject to approval of Education Department.

WREXHAM.—For erecting new vestry at Zion Chapel, Talwrn, Wrexham. Messrs. Lash & Gant, architects :—

Phillip Jones	£263 0 0	Hughes & Owen	£185 0 0
Samuel Moss	193 18 4	R. Griffiths, Coedpoeth*	163 0 0

* Accepted.

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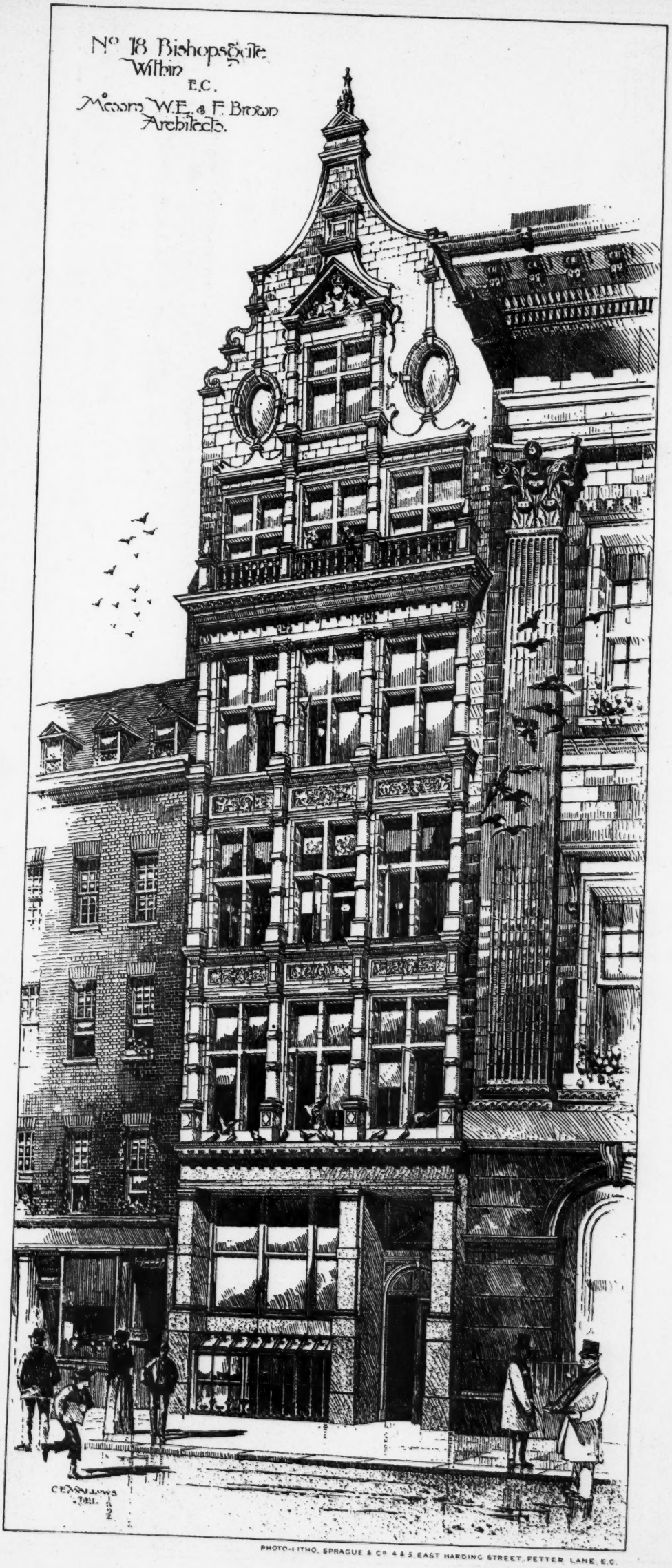

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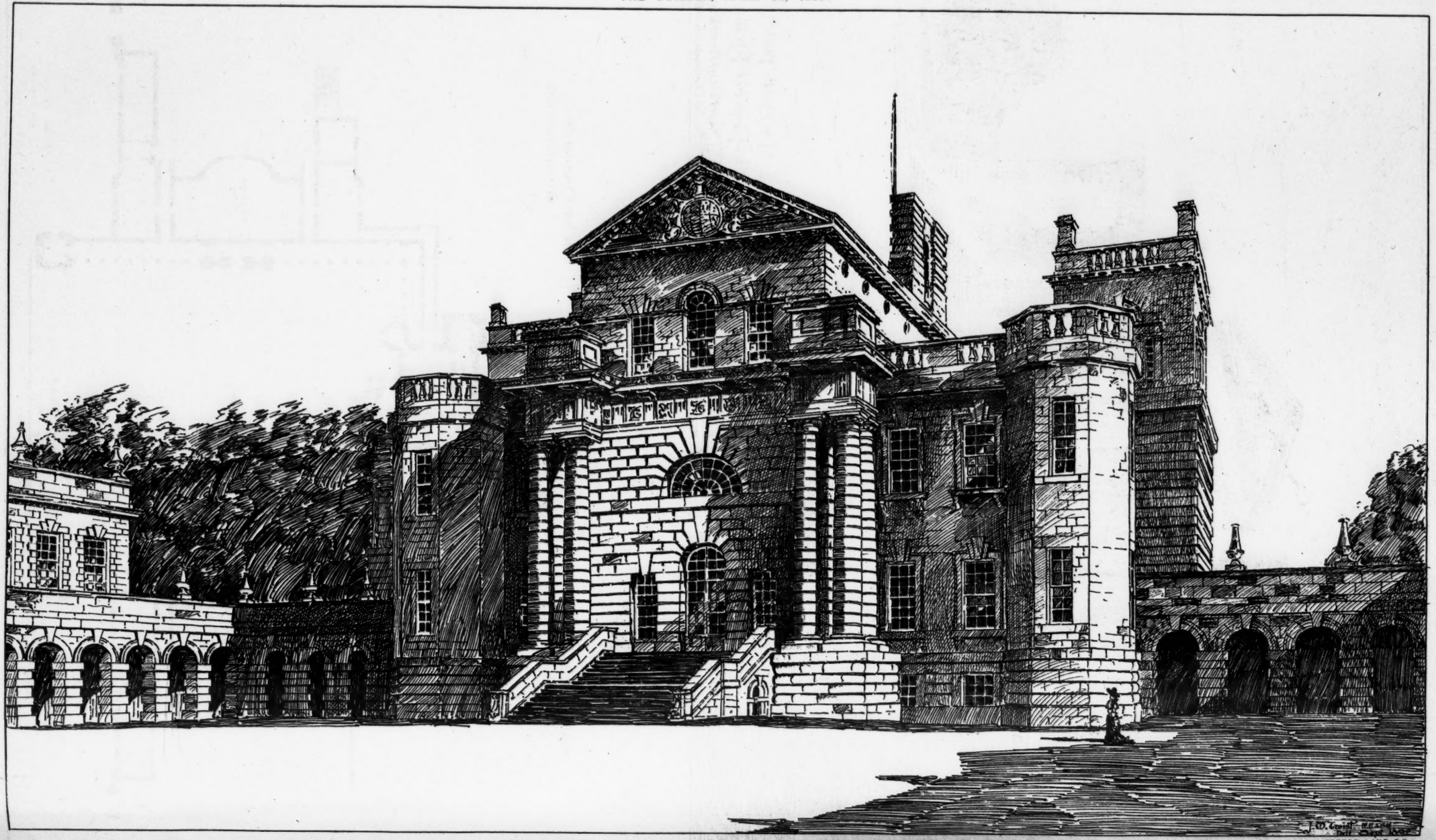

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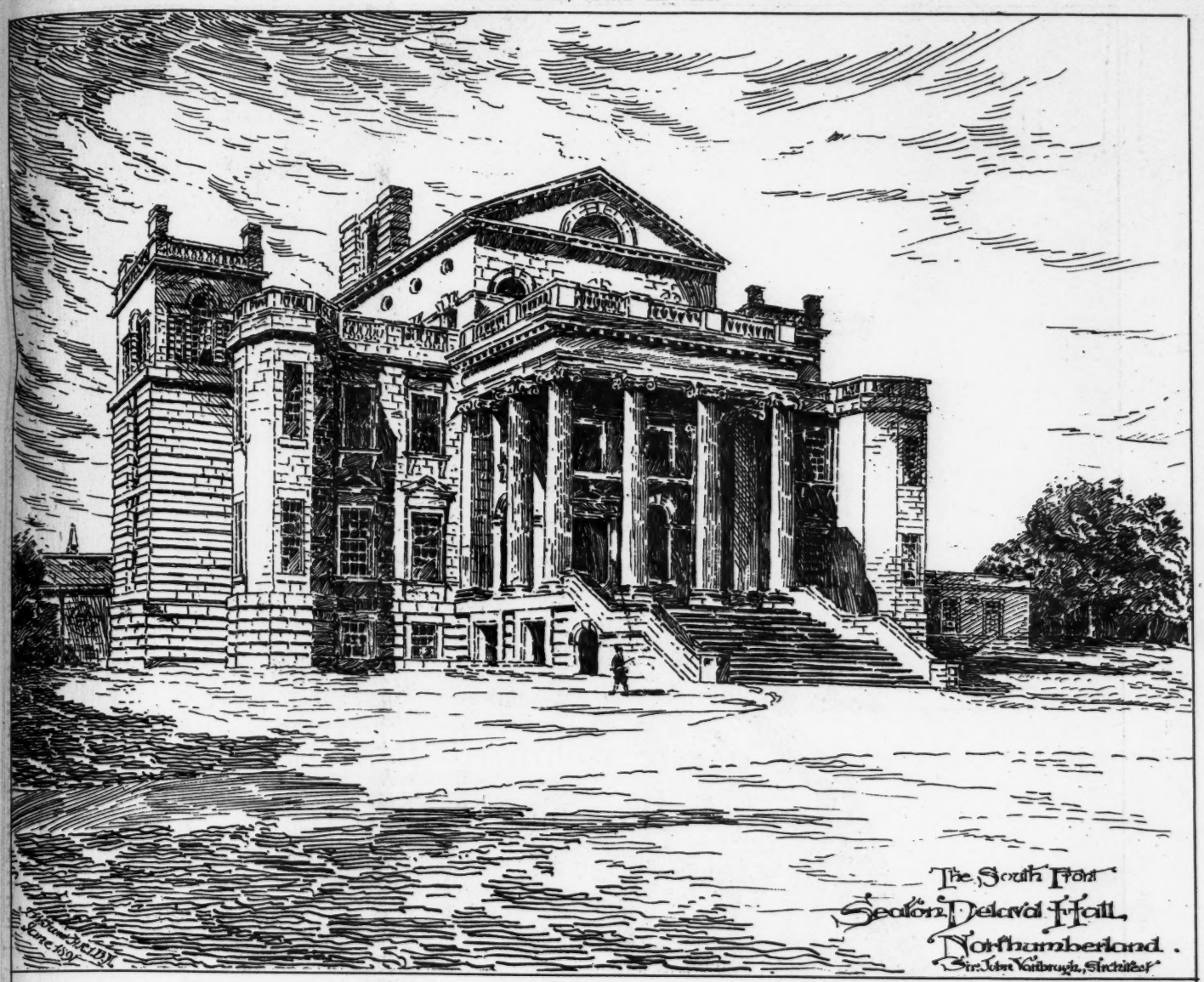
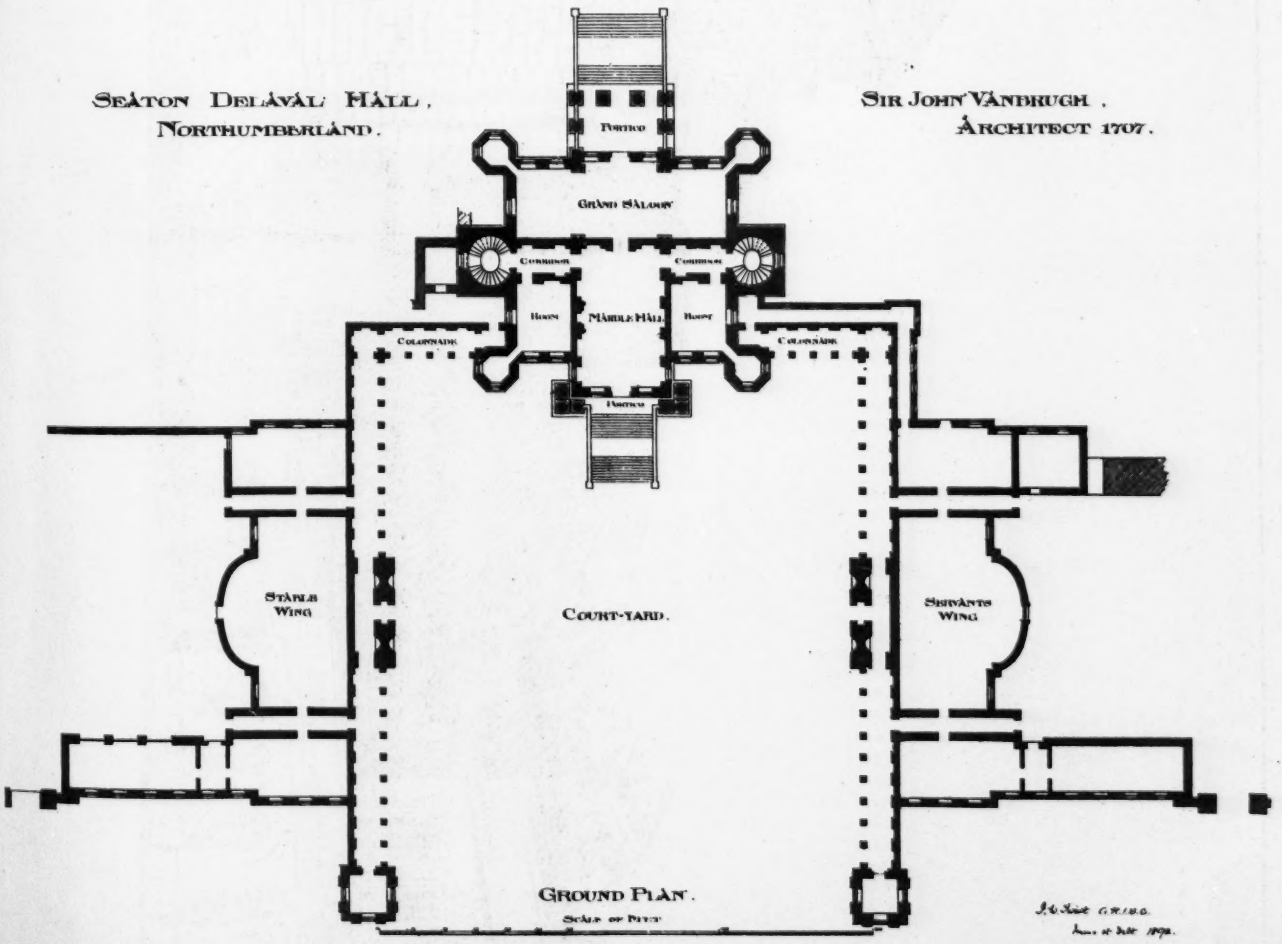
— North Front, Section, Delaval Hall, Northumberland, Sir John Vanbrugh, Architect, 1707. —



The South Front
Seaton Delaval Hall,
Northumberland.
Sir John Vanbrugh, Architect

SEATON DELAVAL HALL,
NORTHUMBERLAND.

SIR JOHN VANBRUGH,
ARCHITECT 1707.

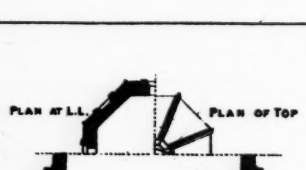


GROUND PLAN.
SCALE OF FEET

PHOTO-LITHO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER, LANE, E.C.

North Front, Seaton Delaval Hall, Northumberland. Sir John Vanbrugh, Architect. 1707.

PHOTO-LITHO. SPRAGUE & CO 4 & 5, EAST HARDING STREET, FETTER, LANE, E.C.



PLAN AT G. G.

The Tower and Saint Michael Coventry W

SCALE OF
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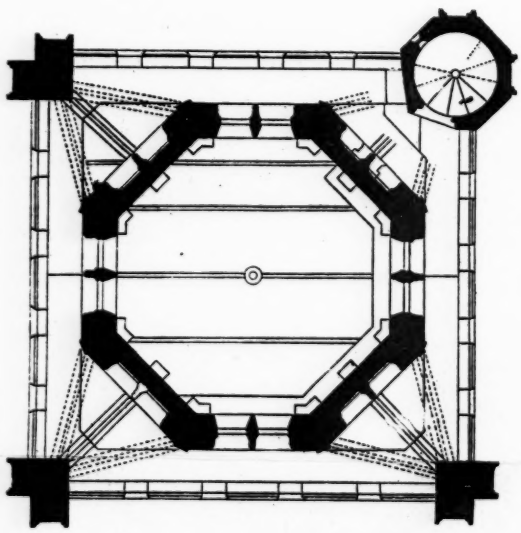
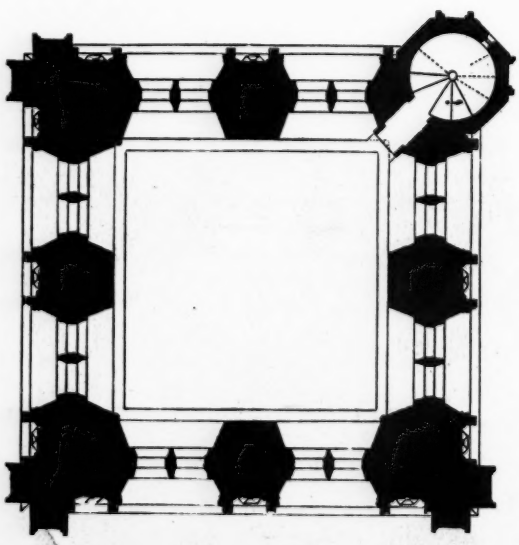


PLAN AT F. F.



PLAN AT E. E.

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SCALE OF FEET.

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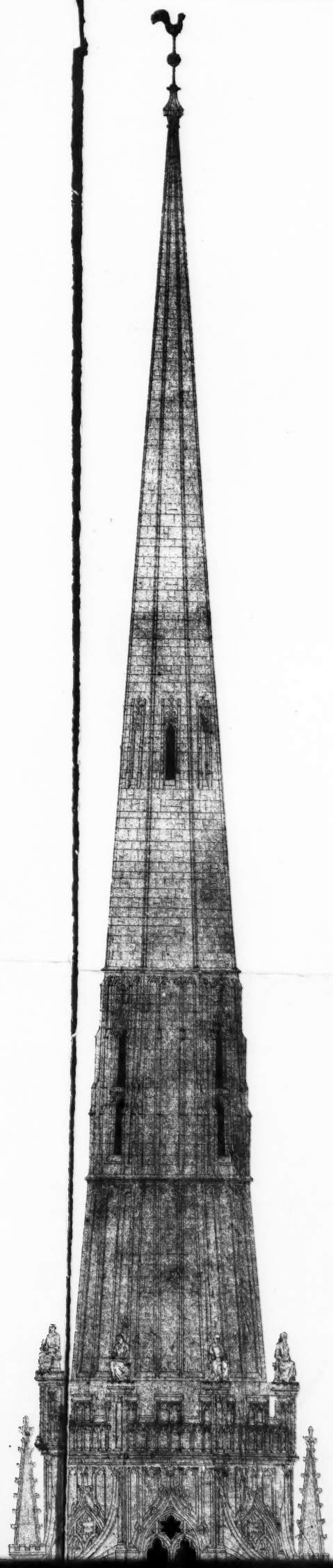
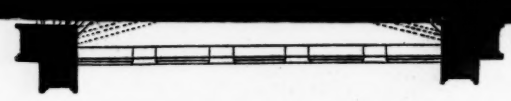
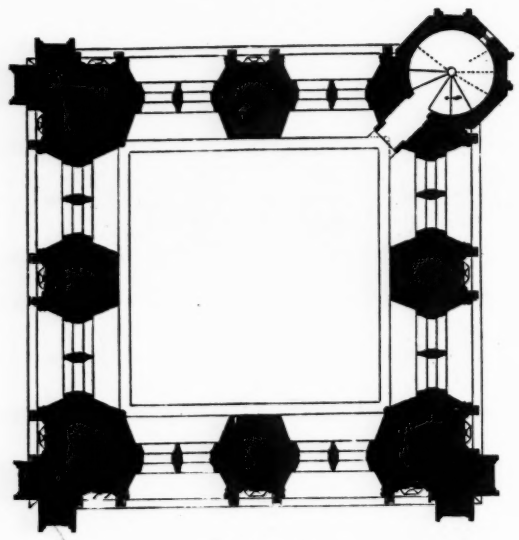




PLAN AT F.F.



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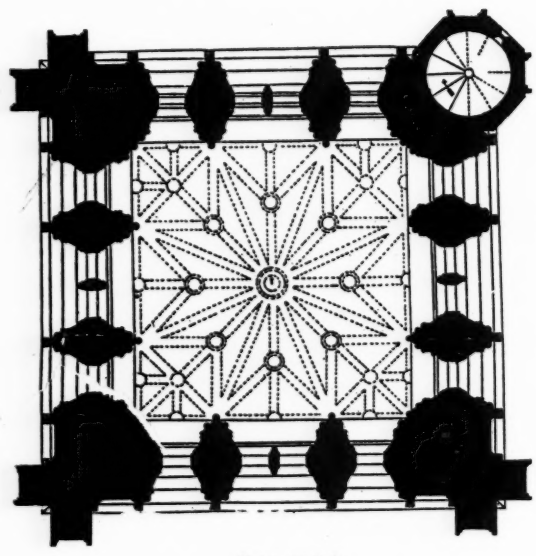
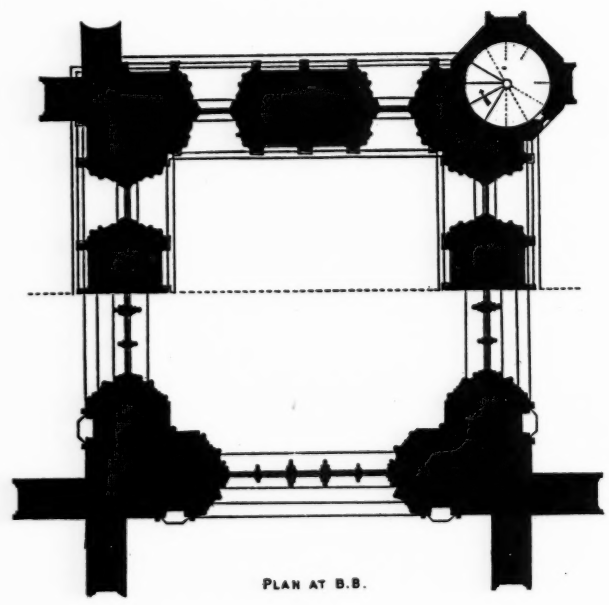


PLAN AT D.D.



PLAN AT B.B.

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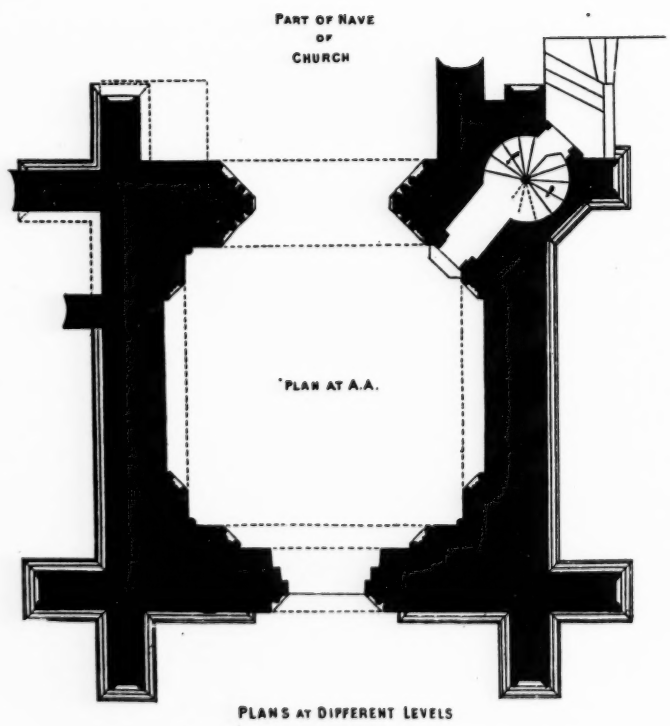
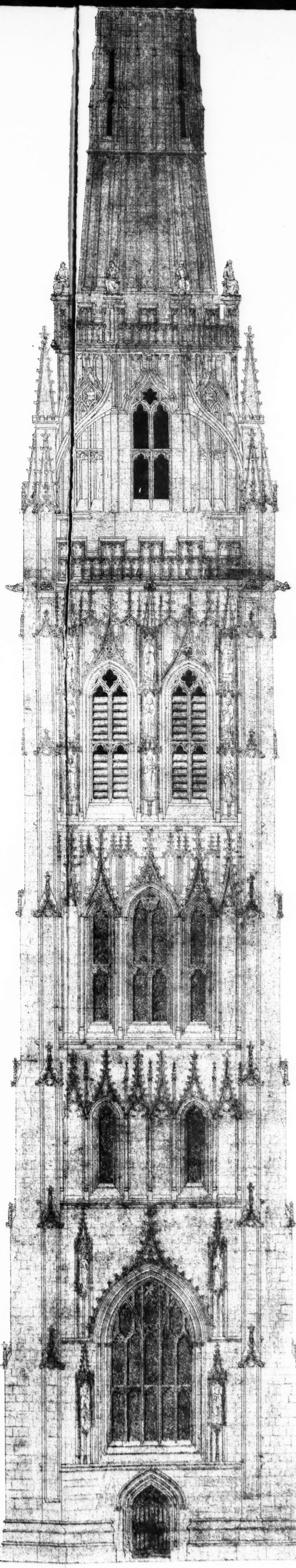


PLAN AT A.A.

PLANS AT DIFFERENT LEVELS
(SEE SECTION)



Section, looking South:.

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